Original Article :

Relapse and Contributing Factors in Schizophrenia Spectrum Disorders: A Study at Muhimbili National Hospital, Tanzania

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Abstract

Background and Aims:
Relapse in patients with Schizophrenia Spectrum Disorder often worsens clinical outcomes. This study examines sociodemographic factors alongside other variables, including follow-up frequency, illness duration, stigma, perceived stress, perceived criticism, and social support, to explore their potential contributions to relapse among patients with schizophrenia at Muhimbili National Hospital, Tanzania.

Methods:
It was a cross-sectional study involved non-probabilistic sampling of patients attending psychiatric clinics at Muhimbili National Hospital, Tanzania. Data were collected through semi-structured questionnaires including Internalized Stigma of Mental Illness Inventory (ISMI), Medication Adherence Rating Scale (MARS), and Oslo Social Support Scale (OSSS-3). Statistical analysis, including odds ratios, chi-square, T-tests, and correlations, was conducted using SPSS-23, with significance determined at $p< 0.05$.

Result:
The study included 100 patients, with 54% male (n=54). Nearly half (49%) were aged 18–39 years, and 63% (n=63) were single. Relapse was significantly associated with younger individuals (p= 0.001), single or divorced (p= 0.001), irregular follow-up (p= 0.003) and shorter illness durations (p= 0.001). Other factors including high stigma (p= 0.027), perceived criticism (p= 0.001), stress (p= 0.015), and poor medication adherence (p= 0.001), and unemployment (p= 0.035), also contributed to increased relapse rates.

Conclusion:
High stigma, criticism, stress, and poor medication adherence contribute to schizophrenia relapse. The study recommends offering interventions that address clinical and psychosocial factors, including improving social support, reducing stigma, and ensuring access to affordable medications. Further research with a larger sample size and broader inclusion of hospitals and geographic areas is recommended to enhance results generalizability.

Keywords:
Relapse factors, Schizophrenia Spectrum Disorder, medication compliance, Tanzania, economic factors, Muhimbili

Introduction:

Schizophrenia presents significant challenges in mental health care due to its profound impact on reality testing. Characterized by symptoms such as delusions, hallucinations, disorganized thoughts, and abnormal behavior, schizophrenia not only affects individuals' cognitive and emotional functioning but also has far-reaching social and economic implications[1] .

Globally, the prevalence of schizophrenia has seen a worrying increase, rising from 13.1 million cases in 1990 to 23.6 million in 2019[2, 3]. Notably, this burden is disproportionately higher in underdeveloped nations, where rates of schizophrenia are approximately 2.5 times those in developed countries[4] . Such disparities raise questions about the underlying socio-economic and healthcare factors influencing these trends. Moreover, the average reduction of 11 life years in individuals with schizophrenia highlights the urgent need for effective management strategies, as the disorder severely impacts occupational, familial, and social domains[5, 6] .

The concept of relapse in schizophrenia, characterized by the recurrence or worsening of symptoms after a period of remission, typically around six months, further complicates the management of this disorder[7,8] . Relapse not only exacerbates the patient's condition but also places a considerable burden on healthcare systems and society at large. Individuals experiencing relapse face higher rates of unemployment, disability, incarceration, and homelessness, accompanied by increased healthcare needs[9,10] . The cost associated with relapse is substantially higher than for those in a stable phase, mainly due to indirect factors like reduced socioeconomic productivity and caregiver burden[11,12]. The national hospital in Tanzania admits approximately 150 psychiatric patients monthly, with about 10% being readmissions due to schizophrenia relapses. This statistic reflects the broader challenges faced in many regions, including issues with mental health care infrastructure, accessibility and affordability of antipsychotic medication, and broader funding and technical challenges within health facilities[13, 14] .

Despite the global increase in schizophrenia cases, which exceeded 23 million in 2019, there remains a significant gap in understanding and managing schizophrenia relapses in developing countries[3,4] , particularly in regions like Tanzania. Schizophrenia relapse, driven by factors such as non-compliance with medication and exposure to stressful life events[15] , poses a substantial challenge in psychiatric care, particularly in settings with limited resources or unique socio-cultural

dynamics. In Tanzania, there is a notable scarcity of comprehensive research focusing on schizophrenia relapse and its associated factors. This lack of data hinders healthcare providers' ability to implement effective strategies for relapse prevention and management. Although global studies have identified various determinants of relapse, the extent to which these findings are applicable or sufficient in the Tanzanian context remains unclear. This gap in knowledge is concerning given the serious implications of relapse, which not only exacerbate patient suffering but also place an increased burden on healthcare systems and adversely affect the socio-economic well-being of communities.

This research aims to address this critical gap by systematically investigating the status and determinants of clinical relapse among patients with schizophrenia spectrum disorders at Muhimbili National Hospital in Tanzania. The study seeks to identify the unique factors contributing to relapse in this setting, providing insights that are crucial for tailoring interventions. The findings of this research are expected to inform and enhance clinical practices, leading to better management strategies for schizophrenia in Tanzania and similar settings, ultimately improving patient outcomes and quality of life.

Methods and materials:

This study employed a hospital-based descriptive cross-sectional design aimed at assessing the status and factors associated with clinical relapse among patients diagnosed with schizophrenia spectrum disorders. The research was conducted at Muhimbili National Hospital, one of the largest hospitals in Dar es Salaam, Tanzania. Established in the early 19th century and formerly known as Sewahaji Hospital, Muhimbili provides comprehensive psychiatric services, making it a suitable setting for this study.

The study population consisted of patients diagnosed with schizophrenia spectrum disorders, as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Participants were eligible for inclusion if they had received psychiatric follow-up services for at least six months, as symptomatic remission typically occurs within this period[7, 8]. All patients provided written informed consent. Patients under 18 years of age and those in a relapsed state without insight, as assessed by the interviewer, were excluded from the study.

The sampling strategy involved non-probabilistic sampling of patients attending the outpatient psychiatric clinics at Muhimbili National Hospital. The

required sample size was calculated using the formula: $n=N/1+(N*e^2)$, where n is the sample size, N is the study population (150), and e is the margin of error (0.05). This calculation yielded a sample size of 109. After excluding three cases with repeated serial numbers and six presentations of acute psychosis, data from 100 patients were included for analysis.

Data collection was carried out using a semi-structured, interviewer-administered questionnaire. The questionnaire covered several domains including sociodemographic characteristics, initial diagnosis, relapse history, and medication adherence, which was assessed using the Medication Adherence Rating Scale (MARS)[16]. Additional sections of the questionnaire addressed comorbid conditions, self-medication practices, and experiences of stigma, which were assessed using the Internalized Stigma of Mental Illness (ISMI) scale[17]. Social support was evaluated using the Oslo Social Support Scale (OSSS-3)[18], while socioeconomic factors, stress levels, and perceived criticism were assessed using the Perceived Stress Scale (PSS-4) [19] and the Perceived Criticism Measure (PCM)[20, 21] , respectively. The questionnaire was translated into Swahili to ensure comprehension and accuracy in responses.

To ensure the reliability and validity of the data collection tool, a pre-test was conducted with ten participants at the Temeke Regional Referral Hospital's outpatient psychiatric clinic. The results from this pre-test were used to refine the questionnaire before full-scale data collection began. Data were collected using Google Forms, managed in Microsoft Excel, and analyzed using SPSS version 23. Descriptive statistics were used to summarize the data, while inferential statistics, including Chi-square tests, correlation analyses, and T-tests, were applied to assess associations between variables. A p-value of less than 0.05 was considered statistically significant.

Ethical approval for the study was granted by the Sumsri Review Committee Board of the University of Medical Sciences and Technology and the Muhimbili National Hospital with Ref. No: MNH/CRTCU/Perm/2024/033 on 17th January, 2024. All participants or their caregivers provided informed consent, and confidentiality was assured throughout the study. Participants were informed of their right to withdraw from the study at any point. Data were securely stored and accessed only for the purposes of research dissemination.

Result:

This study included 100 clients who attended the outpatient clinics at Muhimbili National Hospital between January 23 and

February 9, 2024. The gender distribution showed 54% male and 46% female participants. Almost half (49%) of the participants were between 18 and 39 years old, indicating a significant representation of younger individuals. Those aged 40 to 59 years comprised 39%, while 12% were aged 60 and above. In terms of marital status, 12% of the respondents were divorced, 20% were married, 5% were widowed, and 63% reported being single (Figure 1).

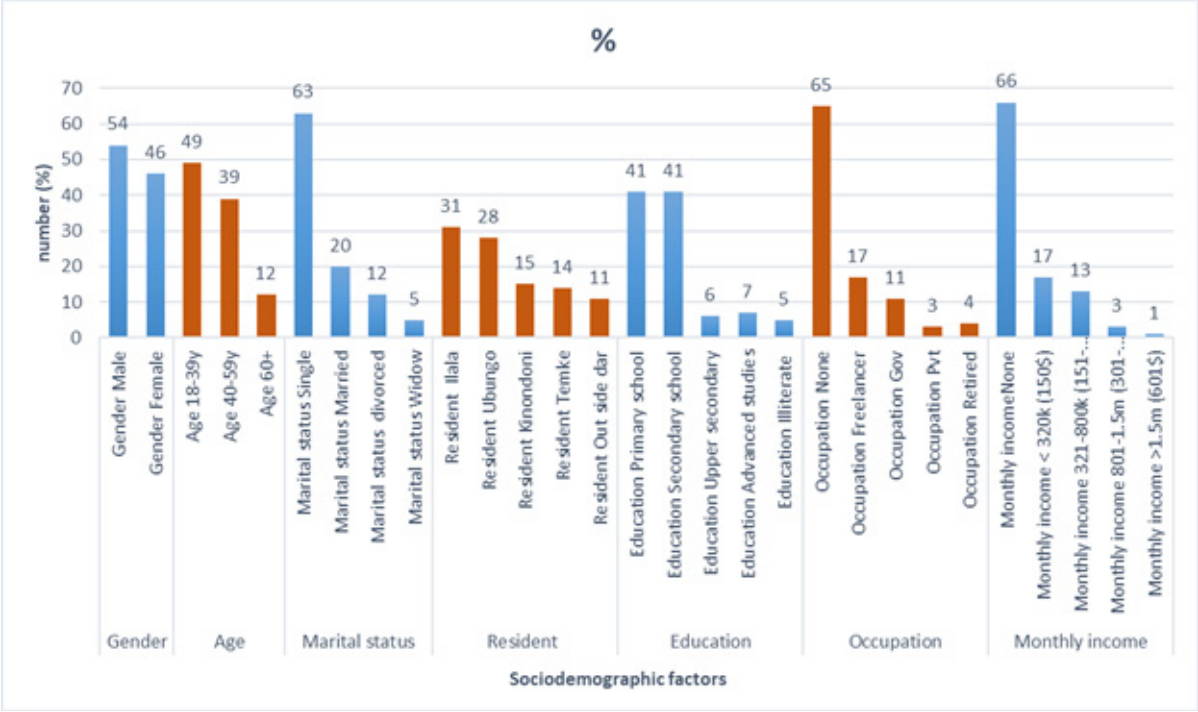


Figure 1: Distribution of the study sample by sociodemographic factors.

Geographically, the majority of clients lived in districts outside of Ilala, where Muhimbili National Hospital is located. Only 31% of participants were from Ilala, while the remaining 69% were from districts such as Ubungo (28%), Kinondoni (15%), areas outside Dar es Salaam (11%), Temeke (14%), and Kigamboni (1%). In terms of education, 7% of respondents pursued education beyond high school, while 6% completed high school, 41% completed primary education, and another 41% attended secondary school. Only 4% were illiterate. A significant portion of the respondents (65%) reported no formal employment, suggesting a potential for socioeconomic challenges. Freelancers made up 17%, while government employees, private sector workers, and retirees accounted for 28%, 3%, and 4%, respectively. Furthermore, 66% of the participants reported having no income, with the remainder falling into lower income brackets, including 17% earning less than 320,000 TZS and 13% earning between 321,000 and 800,000 TZS. Only a small

proportion of participants fell into higher income ranges, earning between 800,000 and over 1,000,000 TZS. Notably, 74% of respondents lacked medical insurance that covered psychiatric illness, with only 26% having such coverage (Figure 1). Medication was widely accessible, with 98% of participants obtaining their medications from the hospital or local pharmacies. Only 2% reported difficulty accessing their prescriptions. Transportation to the clinic was mostly via public transit (91%), with 7% using private vehicles and 2% walking.

Clinically, 10% of patients were diagnosed with delusional disorder, 31% with schizoaffective disorder, and 59% with schizophrenia. The gender distribution across these diagnoses was relatively equal, highlighting the predominance of schizophrenia. Regarding the duration of illness, 70% of participants had been diagnosed for more than eight years, 15% for four to seven years, 14% for one to three years, and 1% for less than one year. Relapses were common, with 44% reporting no relapse within the past three years. On average, patients experienced 1.20 relapses, with a standard deviation of 1.33, and a maximum of six relapses.

Age was significantly associated with relapse (p = 0.001), with younger individuals (18-39 years) showing a higher likelihood of relapse compared to older patients. Marital status also demonstrated a significant association (p = 0.001), where single and divorced individuals had a higher rate of relapse compared to their married counterparts. This suggests that marital status might offer protective factors against relapse. A significant association was found between follow-up frequency and relapse rate. Among those with irregular follow-up, 77% experienced relapse compared to 40.5% of those who attended regular follow-up appointments (p = 0.003) as shown in Table 1.

Table 1: Cross-tabulation of sociodemographic and other variables with relapse status.

Variable and Category No (n, %)		Relapsed		P-Value
		No (n, %)	Yes (n, %)	
Age	18-39y	16 (32.7%)	33 (67.3%)	0.001
	40-59y	23 (59.0%)	16 (41.0%)	
	60+	11 (22.0%)	39 (78.0%)	
Marital status	Divorced	3 (25.0%)	9 (75.0%)	0.001
	Married	17 (85.0%)	3 (15.0%)	
	Single	26 (41.3%)	37 (58.7%)	
	Widow	4 (80.0%)	1 (20.0%)	

Follow up frequency	Irregular	6 (23.1%)	20 (76.9%)	0.003
	Regular	44 (59.5%)	30 (40.5%)	
Co-morbid illnesses	No	32 (42.1%)	44 (57.9%)	0.005
	Yes	18 (75.0%)	6 (25.0%)	
Duration of illness	< 1 year	0 (0.0%)	1 (100.0%)	0.001
	1-3 years	2 (14.3%)	12 (85.7%)	
	4-7 years	3 (20.0%)	12 (80.0%)	
	> 8 years	45 (64.3%)	25 (35.7%)	
ISMI-9*	No stigma	41 (57.7%)	30 (42.3%)	0.027
	High stigma	9 (31.0%)	20 (69.0%)	
Doctor explained condition	No	1 (11.1%)	8 (88.9%)	0.014
	Yes	49 (53.8%)	42 (46.2%)	
Alcohol use	No	43 (56.6%)	33 (43.4%)	0.019
	Yes	7 (29.2%)	17 (70.8%)	
Cannabis use	No	50 (54.3%)	42 (45.7%)	0.003
	Yes	0 (0.0%)	8 (100.0%)	
Self-treatment habits	No	39 (60.0%)	26 (40.0%)	0.006
	Yes	11 (31.4%)	24 (68.6%)	
Job status	Yes	22 (64.7%)	12 (35.3%)	0.035
	No	28 (42.4%)	38 (57.6%)	
Medication prices	Cheap/Insurance	20 (74.1%)	7 (25.9%)	0.005
	Expensive	27 (45.0%)	33 (55.0%)	
Skipping medication	No	40 (64.5%)	22 (35.5%)	0.001
	Yes	10 (27.0%)	28 (73.0%)	

*Internalized Stigma of Mental Illness (ISMI) scale

Medical comorbidities were inversely associated with relapse (p = 0.005); 57.9% of individuals without comorbid conditions relapsed, compared to 25% of individuals with comorbid conditions. The duration of illness was also significant (p = 0.001), with patients who had schizophrenia for one to three years (85.7%) and four to seven years (80%) being more likely to relapse compared to those with illness durations of eight years or more (35.7%) with p = 0.001 (Table 1).

Stigma and relapse were significantly related, with 69% of individuals reporting high stigma also experiencing relapse, compared to 42.3% of those without stigma (p = 0.027). There was also a significant association between patient understanding of their condition and relapse (p = 0.014). Patients who reported that their doctor had explained their condition were less likely to relapse, whereas approximately 90% of those who did not receive an explanation experienced a relapse. Substance

use (alcohol and marijuana) was significantly linked to relapse, with p-values of 0.019 and 0.003, respectively. Specifically, 70.8% of alcohol users and 100% of marijuana users experienced relapse. Furthermore, 68.6% of patients with self-medication habits relapsed, compared to only 40% of those without these behaviors (p = 0.006) as shown in Table 1.

A significant association was found between perceptions of medication prices and relapse (p = 0.005), with 76.9% of those who found medications unaffordable relapsing. Similarly, 55% of those who considered medications expensive relapsed, while only 25.9% of insured patients or those who perceived medications as affordable experienced relapse. Skipping medication doses was significantly associated with affordability concerns (p = 0.0001), with 92.3% of those finding medications difficult to afford, and 38.3% of those considering them expensive, skipping doses. The association between skipping doses and relapse was also significant (p = 0.001), as 76% of those who skipped doses experienced relapse (Table 1).

Most participants (93%) lived with their families, while 6% lived alone, and 1% lived with friends. The OSSS-3 scale revealed that 47% of participants had moderate social support, 35% had weak support, and 18% had excellent support. Social support was significantly associated with relapse (p = 0.022), with lower support correlating with higher relapse rates (mean score for relapsed individuals 8.72, compared to 9.80 for stable patients) as shown in Table 2.

Table2: Comparison of mean scale scores based on relapse status..

Scales	Relapsed	Mean	Std. Deviation	P value
Perceived Stress Scale (PSS-4)	yes	7.96	3.084	0.015
	no	6.38	3.294	
Perceived Criticism Measure (PCM)	yes	5.791	2.1774	0.001
(Patients rate caregiver from 1-10)	no	3.837	2.4488	
Perceived Criticism Measure (PCM)	yes	6.52	2.274	0.024
(Caregiver self-evaluate from 1-10)	no	4.71	2.985	
The Oslo Social Support Scale (OSSS-3)	Yes	8.720	2.3477	0.022
	No	9.800	2.2946	
Medication Adherence Rating Scale (MARS)	yes	6.82	1.574	0.001
	no	7.88	1.239	

Perceived criticism, stress levels, and medication adherence were also linked to relapse. Patients who relapsed reported higher perceived criticism from their own perspective (mean 5.8, SD 2.1) compared to those who did not relapse (mean

3.8, SD 2.4), with a significant p-value of 0.001. Additionally, 53 participants did not answer questions related to perceived criticism from caregivers, but of those who did respond, a significant association was observed (p = 0.027). Patients who relapsed had higher stress levels (mean 8, SD 3.1) than stable patients (mean 6.4, SD 3.3), (p = 0.015). Medication adherence was inversely related to relapse, with relapsed patients reporting lower adherence (mean score 6.8, SD 1.6) compared to those who were stable (mean score 7.9, SD 1.2), with p = 0.001 (Table 2).

Discussion:

The demographic profile of the participants revealed a relatively balanced gender distribution, with a slight male predominance and a significant representation of younger individuals, suggesting that schizophrenia spectrum disorders frequently begin in early adulthood. This observation is consistent with existing literature, which indicates that schizophrenia typically manifests in late adolescence to early adulthood. The majority of participants were single, which may reflect the social isolation commonly experienced by individuals with schizophrenia spectrum disorders. Most participants had been living with the illness for more than eight years, which highlights its chronic nature.

This study identified several factors associated with relapse in schizophrenia spectrum disorders that align with previous research. Younger age was significantly associated with relapse, a finding similar to those of prior studies[13,22] . This may be attributable to younger individuals having more access to illicit substances or not fully grasping the seriousness of their condition. Substance use, including cannabis and alcohol, was also strongly linked to relapse. Interestingly, a shorter duration of illness was associated with higher relapse rates, which mirrors findings from a study conducted in Ethiopia[23] but contradicts other research suggesting that a Additionally, being single or divorced was associated with an increased risk of relapse, echoing findings from studies conducted in Nigeria and Nairobi[13, 24] .

Poor medication adherence and failing to attend follow-up appointments were significant contributors to relapse, findings consistent with numerous prior studies. The degree of social support according to OSSS-3 was significantly associated with relapse in this study. This finding is strongly supported by the existing literature. Multiple studies[14,25] underline the role of social and familial support in promoting medication adherence, reducing stress, and preventing relapse in schizophrenia. The

absence of such support can increase isolation, heighten stress levels, and diminish adherence to treatment regimens, all of which contribute to relapse. These findings emphasize the need for targeted psychosocial interventions aimed at strengthening support networks as part of a comprehensive relapse prevention strategy[15, 23, 26] .

Other social factors such as stigma, and expressed emotions (EE) were also found to have a substantial impact on disease management and outcomes. Interestingly, the absence of medical comorbidities was associated with a higher relapse rate, a finding that contradicts much of the existing literature on psychiatric comorbidities and relapse where comorbid conditions often lead to worse outcomes in schizophrenia patients[2, 5]. This result suggests that additional factors, such as social or psychological stressors, might be influencing relapse rates in this specific population, indicating the need for further investigation into non-medical influences on relapse.

This study also highlighted the importance of patient understanding of their condition and treatment plan. Patients who felt that their doctors did not provide sufficient insight into their condition were more likely to experience recurring symptoms. Moreover, the social environment surrounding patients plays a critical role in medication adherence. Individuals who were advised by friends or family to discontinue medication and who lacked support to counteract this advice were more likely to experience relapse.

Socioeconomic factors, such as employment status and perceived medication affordability, were also associated with relapse. Unemployment and financial strain emerged as significant risk factors, emphasizing the need for targeted interventions to address socioeconomic disparities in access to mental healthcare. Overall, the findings of this study underscore the complex interplay between economic factors, social support, and treatment outcomes in the management of schizophrenia spectrum disorders. Participants who perceived medications as unaffordable were more likely to skip doses, which led to poor adherence and an increased risk of relapse. This highlights the critical need for strategies aimed at addressing these barriers to improve patient outcomes and reduce relapse rates.

Limitations:

This study had several limitations. The cross-sectional design limited the ability to infer causal relationships, and the reliance on self-reported data may have introduced response bias. Additionally, since the study was conducted in a single outpatient clinic,

the generalizability of the findings to other settings may be limited.

Conclusion:

This study highlights the significant role of socioeconomic and cultural factors in influencing relapse among individuals with schizophrenia spectrum disorders in Tanzania. Key risk factors identified include poor medication adherence, inadequate social support, and financial strain, all of which exacerbate relapse rates. Addressing these barriers might be crucial for improving patient outcomes.

To reduce relapse rates, targeted interventions should focus on enhancing social support networks, improving medication adherence through consistent follow-up, and ensuring the affordability and availability of psychiatric medications. Financial assistance programs, vocational training, and employment support can further alleviate the economic burden on patients, reducing the risks associated with unemployment. Collaborative care approaches that integrate psychiatric, social, and community services are essential, alongside stigma reduction campaigns to foster community support and understanding. By implementing these strategies, patient outcomes and quality of life can be significantly improved.

Authors' Contributions:

All authors have contributed equally to all processes of the research work. They have read and agreed to the published version of the manuscript.

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Ethical Approval:

Ethical approval for the study was granted by the Sumsri Review Committee Board of the University of Medical Sciences and Technology and the Muhimbili National Hospital with Ref. No: MNH/CRTCU/Perm/2024/033 on 17th January, 2024.

Conflicts of interest:

The authors report no conflicts of interest in this work.

Informed Consent:

All participants or their caregivers provided informed consent, and confidentiality was assured throughout the study.

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