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# Prevalence and Predictors of Relapse among Patients with Schizophrenia at Psychiatric Healthcare Institutions in North-Western Nigeria

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**Abstract**
**Background:** Nigerians with Schizophrenic disorder are experiencing multiple relapses during the course of the illness. Relapse is disabling and distressing, associated with progressive functional deterioration as well as worsening treatment response and clinical prognosis. **Aim:** Thestudy aims to assess the prevalence and predictors of relapse among patients with Schizophrenia in North-western Nigeria. **Methods:** A cross-sectional descriptive design was employed to conduct the study in Federal Neuro-Psychiatric Hospital Kaduna, Kano State Psychiatric Hospital Dawanau, and Federal Neuro-Psychiatric Hospital Kware, Sokoto States. The Population of the study constitutes all patients with schizophrenia attending the outpatient units of the Hospitals with a sample size of 464 patients a crossed the facilities. A purposive sampling technique was used in the study to recruit respondents. Self -structure Questionnaire was the instrument for data collection. Data collected were analyzed using SPSS Version 23 and presented using mean, standard deviation, frequency, and percentages. Regression analysis was used at a 0.05 level of significance to determine predictors of relapse.. **Results:** Findings revealed that from the year 2018 to 2020, the prevalence of relapse among patients with schizophrenia is very high in the year 2020 with 71% relapse in Kano state, 40% relapse in Sokoto state, and 14% relapse in Kaduna state. The study shows that co-morbid illness, stressful life events, and inadequate mental health services are predictors of relapse ($p<0.05$). **Conclusion:** The study concludes that personal, social, and health facility factors are predictors of relapse among patients with Schizophrenia in North-west Nigeria. **Recommendations:** Emotional and social support like halfway home, assertive community therapy, self -help groups should be provided to patients with schizophrenia, as these can play a vital role in their response to the ailment thereby reducing relapse and the prevalence of the disease.

**Keywords:** *Prevalence, Predictors, Relapse, and Schizophrenia*

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## Introduction

Schizophrenia is a persistent and debilitating mental disorder with a prevalence rate of 1.4-4.6 per thousand populaces, (Gathaiya, Mwaura and Wagoro, 2018). It is regularly associated with relapse even while on treatment. Relapse rate varies from 50%-92% and is similar in both developed and developing nations, in spite of the previous having well-built up mental health services, (Gathaiya, Mwaura, and Wagoro 2018). The disorder affects different mental capacities, like perception, reality-testing, formal thought forms, feeling, behavior, consideration, concentration, inspiration, and judgment. The symptoms causes impressive limitations and obstructions in different areas of existence, study and work, self-care, living abilities, social contacts and interpersonal connections (WHO, 2019).

Globally, the lifetime prevalence of schizophrenia is about 1.4-4.6 percent, which means that about 21 million people will

develop schizophrenia during their lifetime (WHO, 2016). The prevalence ranges between 1 and 17 per 1000 population, one-year prevalence between 1 and 7.5 per 1000, and lifetime prevalence between 1 and 18 per 1000. Variations in prevalence can be related to several factors, including differences in recovery, death, and culture and diagnostic criteria among the affected individuals, (WHO, 2016). Schizophrenia is found in all societies and geographical areas, and the incidence and prevalence rates are roughly similar worldwide (Barbato, 2018). In Africa, the prevalence is 3.4 per thousand populations while Nigeria has a prevalence of 2.4 per thousand populations (Adeosun, 2018).

Relapses are characterized as the recurrence of symptoms of mental ailments compared to those that have already been experienced. It alludes to a return of symptoms after a period of improvement or recuperation. Most patients with Schizophrenia are encountering numerous relapses during the course of the sickness. Relapse is characterized by acute psychotic exacerbation which may have serious implications. For illustration, there's a chance of patients hurting themselves or others, jeopardizing individual connections, instruction, or business status, and of advance stigmatization of the ailment. It is related to a force of psychopathological manifestations or re-hospitalization within the year after hospital discharge, (Abdelsalam, and Gaber 2017).

Predictors for relapse are many such as substance abuse, co-morbid illness, social discrimination, stressful life events as well as refusal to take medications, when socially dynamic people withdraw from social exercises, this can be regularly the primary sign of relapse. Patients usually have social shortfalls, which may include difficulty in social connections or in playing social parts (husband/wife, representative). Subsequently, numerous of these patients don't wed or have constrained social contacts exterior their family environment, (Kim, et al. 2019).

In Nigeria, corresponding information reveals a similar rate of 23% to 70% of schizophrenia relapse depending on the years of the disorder and episodes of the relapse (Maduka & Ihedimma, 2018). In North-Western Nigeria (Kaduna, Kano, and Sokoto states), there has been an increase in a number of patients readmitted with mental disorders within a year than newly admitted patients. One-third of those re-admitted have a diagnosis of schizophrenia, this was indicated in admission registers of the Psychiatric Hospital of (Federal Neuro-Psychiaitric Hospital Barnawa Kaduna, Federal Neuro-Psychiaitric Hospital kware Sokoto, and State Psychiatric Hospital Dawanau Kano). In 2016, of the total of patients admitted 17% of them relapsed within the year. In 2017, of the total number of patients admitted 28% of them were readmitted within the year. In 2018, of the total of the patient admitted, 31% were readmitted within the year. The majority of these re-admitted patients have a diagnosis of schizophrenia (Psychiatric Hospital Dawanau Admission Register, 2016-2018).

The researcher observed that in Psychiatric Institutions in North-Western Nigeria, many patients with schizophrenia usually have a relapse at one point or the other which usually complicates their condition and poses psychological and economic traits to family members, health workers, and society. There is an overall greater social disability which may have contributed to more schizophrenics being unemployed, single, and earning less income thereby lowering the standard of living and affecting the patients' quality of life. Therefore, the present study on prevalence and predictors of Relapse among patients with Schizophrenia in North-Western Nigeria becomes necessary in other to tackle the menace.

**Materials and Methods**

**Design:** The study employed a cross-sectional descriptive design. Descriptive research allows the researcher to generate new knowledge of the subject by describing the characteristics of persons, situations, and the frequency with which certain phenomena

occur. Also, it provides a snapshot of a situation in a population and the characteristics associated with it at a specific point in time (Sambo, 2005).

**Setting**

Federal Neuro-psychiatric Hospital Barnawa-Kaduna, Kaduna state, Federal Neuro-psychiatric Hospital Kware, Sokoto state , and Kano state Psychiaitric Hospital Dawana'u, were the settings for the study. The selection of the settings was due to the fact that they are the main psychiatric Hospitals found in North-Western Nigeria. Although there is Psychiatric Hospital in Jigawa, Zamfara, and Kebbi States, the number of Patients that usually visit those hospitals is less compared to the ones that are in the selected states of Kaduna, Kano, and Sokoto because of their high population.

**Population of study**

All Patients with schizophrenia in Federal Neuro-Pychiatric Hospital Barnawa-Kaduna State, Federal Neuro-Pychiatric Hospital Kware, Sokoto State, and State Psychiatric Hospital Dawanau, Kano State forms the population of the study. According to the Health information record units of Federal Neuro-Psychiatric Hospital Barnawa Kaduna (2020), the average number of schizophrenic patients attending the out- and in-patient unit is (604 patients) in a year which cut across all age groups. Also according to the Health information record units of Federal Neuro-Psychiatric Hospital Kware, Sokoto state(2020), the average number of schizophrenic patients attending the out and in patient unit is (130 patients) in a year which cut across all age groups. The Health information record units of State Psychiatric Hospital Dawanau Kano (2020), revealed that the average number of schizophrenic patients attending the out and inpatient unit is (143 Patients) in a year which cut across all age groups.

**Inclusion Criteria**

Patients with Schizophrenia aged 18 years and above were included in the study, the respondents' date of birth was cross-checked with the information on the patients' record so as to be sure they are within the age range selected for the study.

**Exclusion Criteria**

Newly diagnosed patients and those in the acute stage of illness were excluded from the study.

**Sample Size determination**

The sample size was calculated using Yamane, (1967) sample size selection formula. A researcher is expected to use Yamane sample size calculation when working with a finite population and if the population size is known.

Where $n = \frac{N}{1+N(e)^2}$

N = total population

E = degree of precision $(0.05)^2$

The average population of schizophrenic patients attending the federal neuro-psychiatric out-patients unit in a year is 604 patients according to the health information unit of the hospital, therefore

Also, the average population of schizophrenic patients attending Federal Neuro-Psychiatric Hospital Kware Sokoto State in a year is 130 patients according to the health information unit of the hospital. From the records, the average population of schizophrenic patients attending State neuro-psychiatric out-patients unit of Dawanau Kano State in a year is 143 patients according to the health information unit of the hospital. Therefore by adding 604, 130, and 143 patients from the three Psychiatric hospitals, we have a total number of 877 patients as the population of the study. Therefore to determine the sample size we applied the Yamane formula below:

$\frac{877}{1+877\ (0.05)^2}$ i.e. minimum sample size, approximately 464 patients were recruited in the study.

Proportionate allocation was done at the three psychiatric hospitals, in FNP Hospital Kaduna we have 604 patients, therefore $\frac{604}{877}$ X 464 = 319 patients

FNP Hospital Kware, Sokoto we have130 patients, therefore $\frac{130}{877}$ X 464 = 69 patients

Psychiatric Hospital Dawana'u, Kano we have143 patients, therefore $\frac{143}{877}$ X 464 = 76 patients

The purposive sampling technique was further used to select the respondents at the various healthcare institutions. Asika (2001), stated that in purposive sampling, a researcher can choose some elements which may be guided by what he considers typical cases which are most likely to provide him with the requisite data or information. Therefore, the researcher purposely identified and selected patients with Schizophrenia who are available, from 18 years and above in the out-patients units who know that the signs and symptoms of their condition are that of mental illness, and those that will give a clearer view of the factors that affect them in the course their ailment.

**Instruments of Data Collection**

**A self-structured questionnaire** was used to collect the data. The questionnaire was interviewer-administered. Section A: Socio-Demographic Variables of the Respondents, Section B: To determine the Predictors of Relapse as perceived by Patients with Schizophrenia at the Psychiatric Healthcare Institutions in North-Western Nigeria. It consists of 15 items, developed by the researcher, determined as personal, clinical, and health facility factors.

**Records of Mental Health Services**

Psychiatric/Mental health problems diagnosed, as well as the care and treatments provided at the institutions were assessed in other to determine the Prevalence of Relapse. Moreover, medical records of in and out-patient admission and follow-up cases from 2018 to 2020 were collected from the Federal Neuro-Psychiatric Hospital, Kaduna, Sokoto, and Kano states as a proxy to the burden of relapse in schizophrenia in north-western Nigeria.

**Validity and Reliability of the Instruments**

In other to ensure the validity of the instruments, content and face validity were applied, (Noble, 2020). The questionnaires were presented to a team of five experts from the Department of Nursing Science and the Department of Psychiatric of ABU Zaria to vet the instruments for face and content validity. A pretest of the instruments was done to ensure reliability, it involve 30 respondents, approximately representing 10% of the study population, done at ABUTH Psychiatric Unit. Internal consistency was assessed to determine the correlation between multiple items in a test that are intended to measure the same construct. The reliability was analyzed using the Kappa statistic, which found an acceptable reliability coefficient, Cronbach's alpha of 0.89.

**Methods of Data Collection**: The data collected was drawn from both primary and secondary sources. The primary data was obtained from the responses from questionnaires, while the secondary data was obtained from medical records and registers at Neuro-psychiatric Hospitals (Kaduna, Kano, and Sokoto), consisting of schizophrenic cases seen and/or treated and re-admissions at the centers.

In preparation for data collection, three (3) psychiatric nurses with a Bachelor's degree in Nursing Science were recruited and trained to provide assistance to the researcher. A meeting was scheduled with the research assistant, during which responsibilities were discussed. The study's design, the activities involved and the mode of operation was explained to them. The researcher emphasized the need for confidentiality on what may be discussed during the Questionnaire administration. The researcher went through

every item in the questionnaire with the research assistants to ensure proper understanding with which they could guide the patients, relatives, and nurses in case of any misunderstanding.

The respondents were present at the various selected hospitals because it serves as psychiatric and rehabilitative unit for Schizophrenic patients in North-western Nigeria. The researcher and assistant introduced themselves as well as informed the respondents about the objectives of the study and informed the patients that participation is voluntary and confidentiality was maintained. The questionnaires were researcher/interviewer administered at the various selected hospitals by the researcher and assistants. The data were collected from the respondents in each of the settings within twelve weeks duration, concurrently on clinic days, Mondays, and Thursdays in Dawana'u psychiatric hospital Kano. While in Kaduna and Sokoto states the data was collected on Mondays, Tuesdays, Thursdays, and Fridays.

**Method of Data Analysis**

The data obtained through the questionnaire were coded and entered into the computer coding sheets. It was processed with the statistical package for social science (SPSS, version 23). In the analysis of the respondent's socio-demographic characteristics appropriate descriptive statistical techniques including frequency tables, and percentages were applied.

The Prevalence of relapse among patients with schizophrenia was analysed using descriptive statistics in the form of frequency and percentages, while the Predictors of relapse among patients with schizophrenia were determined and analyzed using multiple linear regression analysis.

**Ethical consideration**

Official and approval document in terms of ethical clearance and permission to conduct the study was sort from the Ministry of Health Kano state, research ethical committee (NHREC/17/03/2018). Written informed consent was sorted from the patients and family relatives after a full explanation and details on, the research aim, objectives, and duration of the study. Participation was voluntary and confidentiality was maintained. Ethical conduct is very important in studies that deals with human, most especially those with mental illness in other to ensure that their rights are protected.

**Results**

A total of 464 participants were recruited for the study.

**Table 1:** *Socio-demographic characteristics of respondents, (n= 464)*

| Variables | Frequency | Percent (%) |
|---|---|---|
| **Age** | | |
| <25 year | 136 | 29.3 |
| 26- 45years | 295 | 63.6 |
| 46years and above | 33 | 7.1 |
| Mean age= 32years | | |
| **Gender** | | |
| Male | 356 | 76.7 |
| Female | 108 | 23.3 |
| **Religion** | | |
| Islam | 361 | 77.8 |
| Christianity | 101 | 21.8 |
| Others | 2 | 0.4 |
| **Education** | | |
| Non -formal | 79 | 17.0 |
| Primary | 69 | 14.9 |
| Secondary | 178 | 38.4 |
| Post-secondary | 138 | 29.7 |
| **Marital status** | | |
| Married | 130 | 28.0 |
| Single | 300 | 64.7 |
| Divorced | 24 | 5.2 |
| Widowed | 10 | 2.2 |
| **Employment status** | | |
| Unemployed | 237 | 51.1 |
| Private employed | 53 | 11.4 |
| Government employed | 66 | 14.2 |
| Self-employed | 108 | 23.3 |

Table 1, above shows the socio-demographic variables of the respondents, (63.6%) are within the age range of 26-45 years with a mean age of 32, (76.7%) are males, (77.8%) are Muslims, (38.4%) have attended secondary, (64.7%) are single, while (51.1%) are unemployed which constitutes the majority of the respondents.

**Table 2:** *Distribution of respondents according to medical history, n=464*

| Variables | Frequency | Percent (%) |
|---|---|---|
| **Duration of illness** | | |
| **1-5years** | 119 | 25.6 |
| **>6years** | 345 | 74.4 |
| **Re-admission** | | |
| Yes | 393 | 84.7 |
| No | 71 | 15.3 |
| **Drug compliance** | | |
| Poor | 270 | 58.2 |
| Fair | 122 | 26.3 |
| Good | 72 | 15.5 |

Table 2, above shows that (74.4%) have a duration of their illness from 6 years above, (84.7%) have been re-admitted, while the majority (58.2%) have poor drug compliance habits.

**Table 3:** *Chi-square showing association between medical history and predictors of relapse*

| Medical History | Predictors | $X^2$ | D.F | P-Value |
|---|---|---|---|---|
| Duration of illness (345) | Personal factors ( substance abuse, co-morbid illness, poor drug compliance). (0.032) | 344.9 | 0 | 0.000 |
| Re-admission (393) | Social factors (social discrimination, stressful life events, lack of social support), (0.050) | 392.9 | 0 | 0.000 |
| Drug compliance (270) | Health facility factors (shortage of antipsychotic medication, inadequate mental health services, adverse side effects). (0.041) | 269.9 | 0 | 0.000 |

**P<0.005**

Table 3 shows that a significant association exists between Medical History and Predictors of relapse with p<0.000.

**Table 4:** *Prevalence of Relapse (re-admission) of Schizophrenic cases during the year (2018-2020)*

| States | Admission | Re-admission | Percent of Readmission |
|---|---|---|---|
| **Kaduna** | | | |
| 2018 | 604 | 22 | 3.6 |
| 2019 | 554 | 47 | 8.4 |
| 2020 | 599 | 84 | 14.0 |
| **Sokoto** | | | |
| 2018 | 126 | 71 | 56.0 |
| 2019 | 130 | 66 | 50.0 |
| 2020 | 235 | 96 | 40.0 |
| **Kano** | | | |
| 2018 | 126 | 61 | 48.0 |
| 2019 | 143 | 76 | 53.0 |
| 2020 | 114 | 82 | 71.0 |

Table 4, above shows the prevalence of relapse in schizophrenia in 2018, 2019, and 2020 in Kaduna, Sokoto and Kano states. In the year 2020 in Kaduna state, 559 patients were admitted, and (14%) patients relapsed, in Sokoto state 235 were admitted and (40%) relapsed, while in Kano 114 were admitted and (71%) relapsed.

**Table 5:** *Regression analysis on predictors of relapse among patients with schizophrenia n=464*

| Model | R Square | Change statistics | |
|---|---|---|---|
| | | F Change | Sig. F Change |
| Personal factors ( substance abuse, co-morbid illness, poor drug compliance) | 0.032 | 2.979 | 0.012 |
| Social factors (social discrimination, stressful life events, lack of social supports) | 0.050 | 4.014 | 0.001 |
| Health facility factors (shortage of antipsychotic medication, inadequate mental health services, adverse side-effects). | 0.041 | 2.451 | 0.013 |

R<0.9, F-statistics improve significantly, p<0.05

Table 5, above shows that $r^2$ is (0.032, 0.050, and 0.041) which is less than 0.9, F change (2.979, 4.014, and 2.451) which improves significantly with a $p<0.05$. This shows that both personal, social, and health facility factors are predictors of relapse. This means that personal factors, social factors, and health facility factors are all predictors of relapse in schizophrenia as $p<0.01$. The most important part of the table is the F-statistic and its associated significance value of $p<0.001$. This p<value tells us that there is less than a 0.1% chance that an F-statistic at least would happen if the predictors are true. Therefore, we could conclude that our model results are significantly better predictors, that is both personal, social, and health facility factors are predictors of relapse.

**Discussion**

The researchers assessed the prevalence and predictors of relapse among patients with Schizophrenia in North-Western Nigeria. Table 1 shows the demographic characteristics of the patients. The Table shows the ages of the subjects that cut across various age groups from 18 years and above with more concentration in the age range of 26-45 years constituting the majority of the total number of the respondents with the mean age of 32years, these shows that most schizophrenic patients seen in the psychiatric healthcare facilities in North-western Nigeria are in the adulthood state where the country needs their active services more, but instead of contributing positively towards the development of the nation, they are seen roaming around the streets due to their ill mental health state. This finding is consistent with the study of Kim et.al (2019), who stated that early-adult onset of schizophrenia, may be considered from 18 to 30 years of age. Middle-age onset may occur between the ages of 30 to *45* years. Late-onset may be considered after *45* years of age. But the exact determination of the onset can be very difficult, as the illness does not suddenly "strike". More obvious psychotic symptoms are preceded by more ambiguous behaviors. Most subjects as indicated in the table have attained secondary education. This indicates that the respondents should be able to understand predictors of relapse. Even though they attain a certain level in their education, more than half of the respondents are not employed. This explained why most of them have financial problems. Findings showed that more than half of the total number of the respondents are not married, this may be attributed to the social stigma that is attached to the illness in society.

Concerning the prevalence of relapse among schizophrenic patients in psychiatric healthcare institutions in north-western Nigeria, findings show that the rate is high. Despite recent therapeutic progress, relapse in schizophrenia is prevalent and became a common major problem in the management of schizophrenia. Relapse rates vary from 50%-92% and are similar in both developed and developing countries, despite the former having well-established Mental health services (Gathaiya, Mwaura, and Wagoro, 2018). For patients with 1 year prevalence of schizophrenia the relapse rate is 28%, 43% for 1 to 1.5, and 54% for 3 years and above. In a systematic analysis conducted in china by Wu et.al (2017) with multi-episode samples, the study reports varying rates of relapse, with four reporting symptom recurrence rates of close to 80% at 12 months and two reporting rates of about 95% at 24 months after discontinuation of medications. With each relapse in schizophrenia, there is a longer period of recovery and increase drug resistance (Wu et.al, 2017). Edna et al (2016) argued that relapse in schizophrenia remains common and cannot be entirely eliminated even by the best combination of biological and psychosocial interventions. It has become a problem that contributes majorly to the high burden of disability of mental illness. Relapse has significant implications both in terms of the cost of health care and economic burden as well as the personal implications of the loss of functioning and demoralization for the individual. Relapse in Schizophrenia is a

debilitating mental health problem that has a significant impact not only on the patient but also on the entire family as well, most especially in North-western Nigeria where the poverty level is on the increase.

The increased prevalence of relapse among patients with Schizophrenia can contribute to poor prognosis of the condition because of negligible mental health services in Nigeria. These finding is in line with the study of Maduka and Ihedimma (2018) who he reported several episodes of increasing impairment in patients with schizophrenia on the increase due to relapse.

The study also determines the predictors of relapse among patients with schizophrenia in north-western Nigeria. The study revealed that both personal, social, and health facility factors are predictors of relapse with $p<0.05$ using regression analysis. Also, there is a significant association between Medical history and Predictors of relapse. This finding is in line with the study of Wu, et al (2017), who identified predictors of relapse in Schizophrenia to be mostly social factors. In the study, relapse rates of Schizophrenia patients after hospital discharge and their possible factors were investigated to differentiate short-term and long-term predictors for relapse in Schizophrenia in China. The factors influencing relapse in Schizophrenia were analyzed by logistic regression. The results indicated that the relapse rate after hospital discharge of patients with Schizophrenia occurs in about almost one-quarter of the respondents. Compliance with medication use, communication skills, and work/study functioning were associated predictors of relapse in schizophrenia, with differential long-term and short-term effects.

**Conclusion**

Based on the findings of the study, it can be concluded that the prevalence of Relapse among patients with schizophrenia in North-western Nigeria is on the increase with the highest being observed in 2020 in Kano state with 71% raised. The study shows that both personal, social, and health facility factors are predictors of relapse with $p<0.05$.

**Recommendations**

Following the findings of the study, it is recommended that:

1. Emotional and social support like half way home, assertive community therapy, self-help groups should be provided to patients with schizophrenia by Government and Non-governmental Organizations, as these can play a vital role in their response towards the ailment thereby reducing relapse.
2. Family-focused psychosocial interventions should be encouraged by hospital management, this will go a long way in curtailing relapse in patients with schizophrenia thereby reducing the prevalence rate.

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