Predictors of psychiatric readmissions to the psychiatric unit of a tertiary health facility in a Nigerian city - a 5-year study

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Abstract
Objective: Little is known about predictors of readmission of psychiatric patients in the study environment. Knowledge of this, we believe could aid effective management of psychiatric patients, as well as judicious and equitable utilization of the limited mental health facilities in the North-central zone. The aim was to identify factors that may be predictive of readmissions to an in-patient psychiatric facility of a Nigerian University Teaching Hospital. **Method:** A retrospective record review of all admissions and discharges to/from the psychiatric in-patient ward of University of Ilorin Teaching Hospital, (UITH) between May 2000 and April 2005. Patients and clinical characteristics were recorded and all the data were characterized according to age, gender, marital status, occupational status, length of stay on admission, number of admissions, and medication compliance. Data were analyzed with SPSS version 11 to derive the chi square figures, Pearson's correlation, and logistic regression. The level of statistical significance was set at 5%. **Results:** Within the study period, 41.4% of cases were readmissions. Young age, longer length of stay, multiple admissions and the diagnosis of schizophrenia were predictive of readmission while medication non-compliance was not predictive. **Conclusion:** Provision of psycho-education to both the patients and their families, identification of early symptoms of relapse, application of immediate and appropriate measures, and adequate record-keeping by health institutions are advocated.

Keywords: Psychiatric readmissions; Predictors; North-central Nigeria

Introduction

The current management practice of reduced length of psychiatric hospitalization, resulting from the policy of de-institutionalization in Nigeria has led to increased readmission rates for individuals with severe and persistent psychiatric disorders. This has had a major impact on the costs and management of inpatient facilities.[1] For instance, because of the extended family system in Africa, the problems of psychiatric readmissions could place a tremendous burden on the already vulnerable patients and their families, and could be frustrating and demoralizing to mental health care givers. According to Bobier and Warwick, psychiatric in-patient care is often indicated when a patient can no longer be managed safely at home or as an out-patient, but may however be costly, resource intensive and cause risk to hospital staff.[2] Therefore, determining the trend in readmissions and discharges in a given psychiatric facility could aid effective management of patients, correct planning, and distribution of psychiatric resources.

Studies have observed that readmission into psychiatric hospitals may be indicative of incomplete in-patient treatment during an earlier admission or poor follow-up after discharge, or reflect a breakdown in the service delivery system.[3,4] This may result in undesirable consequences for patients such as the inability to live independently.[5] Factors that have been associated with readmission into psychiatric in-patient facilities include short durations of admission, lack of significant others (single, divorced, or widowed), medication non-compliance, and poor housing.[2,3,6,7] Other factors include poor post-discharge services, younger age, and clinical diagnosis. While some studies have associated schizophrenia with readmissions[8,9], others have identified affective disorder.[2,7,10] Some studies have identified lower socioeconomic status, financial problems, older age, single marital status, female gender, comorbid disorders, including substance-related disorders, sexual and impulse control disorders.[4,11]

While several researchers in developed countries have tried to predict psychiatric readmission, such research efforts in the developing nations are minimal or non-existent despite the fact that treatment programs here are largely hospital-based with comparatively overwhelming need for psychiatric facilities as evident by rapid population growth, and continuing socio-economic decline.[12]

Due to the scarcity of data on psychiatric inpatient facilities in

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developing countries, and in Nigeria particularly, it is imperative to generate information about the service provided in an inpatient unit of a tertiary health institution in this context. It is our belief that identifying predictors of utilization of such facilities might better inform clinicians' choice of treatment and disposition, and lead to improved service delivery systems.

The possible outcomes of the study include: (i) to ensure delivery of comprehensive mental health services, provided in a competent and effective manner using the identifiable predictors of readmissions as guides; (ii) to minimize the incidence of readmissions of patients with psychiatric disorders, and by extension, to reduce the over-utilization of mental health facilities by recidivists and the burden of readmissions on mental health staff; and (iii) to generate baseline information on recidivism in the North-central zone of Nigeria for future researchers.

The hospital

The University of Ilorin Teaching Hospital (UITH) is a 450-bed tertiary health institution, located in Ilorin, the capital of Kwara State of Nigeria, West Africa. Ilorin is about 500kms from Abuja, the Federal Capital of Nigeria and 350kms from Lagos, the commercial center of the country. The hospital belongs to the second generation of Teaching Hospitals in the country which were established by law in 1980. It provides health services for Kwara State, a north-central state of Nigeria, and takes referrals from other states (Benue, Kogi, Niger, Osun, and Oyo) in the region. It has a 20-bed psychiatric unit (10 beds each for either gender) for in-patient care and has six psychiatrists (including a Professor), seven psychiatric residents, a clinical psychologist, an occupational therapist, two social workers, three EEG technicians, and psychiatric nurses. Laboratory facilities (chemical pathology and immunology, haematology, histopatology, medical microbiology, parasitology, and radiology) are also available for necessary investigations.

Methods

Patient records of all admissions and discharges from the in-patient psychiatric ward of the hospital between May 2000 and April 2005 were identified and retrieved from the ward's admission registers by PMT. Information on the socio-demographic (e.g., age, gender, marital status, and occupation), and clinical characteristics (e.g., diagnoses, length of stay, number of readmissions, family history of mental illness, past psychiatric history, treatment, medication compliance and adverse reactions to medications) was extracted from the case files. Patients' occupation was classified according to the system of Borofka and Olatawura.[13] The cases were reassessed by the senior researchers (YAD, APO, and IBA) using ICD-10 criteria based on the clinical features documented and clinical diagnoses were reassigned where necessary.

The cases were categorized in terms of single versus multiple admissions and compared to determine those variables that may be associated with readmission. Patients who were admitted in the hospital for the 1st time, regardless of previous admission outside the hospital, were regarded as index (or single) admissions and those who were admitted twice or more to this hospital, as multiple admissions. Data was analyzed using SPSS version 11. Frequency distribution, cross tabulations, and chi-square figures were calculated for the categorical variables, while ANOVA was used for comparing means of the continuous variables. The level of statistical significance was set at 5%. The variables with significant association were correlated using Pearson's correlation

coefficients, and later entered into logistic regression analysis to determine the predictive strength of these variables.

Of the 789 records of admissions identified and retrieved within the study period, 502 (63.6%) had complete information and were analyzed, a sample size considered sufficient to give an overview of readmission patterns within the study period.

Results

Socio-demographic and clinical characteristics

Comparing the patients' mean age at index admission and at readmissions, there was significant association between age and readmission, with patients who were readmitted significantly more likely to be younger (i.e., 21-40 year age-group) (F=18.1, p<0.000). Similarly, there was a significant association between length of stay in hospital and readmission, with readmitted patients significantly more likely to stay longer in hospital (F=6.2, p<0.01). Patients who had a diagnosis of schizophrenia were significantly more likely to be readmitted (x^2=24.1, df=4, p<0.0001). There was also a significant association between medication non-compliance and readmission (x^2= 177.5, df=1, p<0.000).[Table I]

Table I Comparisons of variables between single (index) admissions and readmissions.

Variables	Single (index) admission (N=294, 100%) N (%)	Readmission (N=208, 100%) N (%)
Mean age:	29.4 (SD=10.1)	32.0 (SD=10.4)†
Gender:		
Male	144 (49.0)	98 (47.1)
Female	150 (51.0)	110 (52.9)
Marital status:		
Single	177 (60.2)	114 (54.8)
Married	117 (39.8)	93 (44.7)
Divorced/widowed/separated	-	1 (0.5)
Occupational status:		
I	11 (3.7)	11 (5.3)
II	53 (18.0)	37 (17.8)
III	15 (5.1)	11 (5.3)
IV	11 (3.7)	7 (3.4)
V	67 (22.8)	54 (26.0)
VI	22 (7.5)	12 (5.8)
Students	111 (37.8)	70 (33.7)
Retirees	3 (1.0)	4 (1.9)
Clergies (Islam/Christians)	1 (0.3)	2 (1.0)
Psychiatric diagnoses:		
Schizophrenia	142 (48.3)	134 (64.4)*
Depression	14 (4.8)	7 (3.4)
Mania	10 (3.4)	14 (6.7)
Psychoses	75 (25.5)	40 (19.2)
Others	53 (18.0)	13 (6.2)
Mean number of admission	1.0 (SD=0.0)	2.9 (SD=1.5)
Mean length of stay (days)	22.1 (SD=18.9)	26.4 (SD=19.3)‡
Medication compliance:		
Yes	232 (78.9)	39 (18.8)
No	62 (21.1)	169 (81.3)**

*x^2=24.1, df= 4, p<0.0001, OR=0.5, RR=1.4 (?x^2=84.8, df=64, p<0.04; r=-0.1, p<0.05)
** x^2=177.5, df=1, p<0.000
† ANOVA= F=18.1, p<0.0000
‡ ANOVA= F=6.2, p<0.01

Table II demonstrates the findings of (a) positive correlations between medication non-compliance and age, length of stay and number of admissions and between length of stay and number of admissions and (b) negative correlations between a diagnosis of schizophrenia and age, length of stay and medication non-compliance.

Predictors of readmission

The 4 statistically significant factors associated with readmission were entered into logistic regression analysis in order to determine which of them independently could predict readmissions(Table III). Four of them emerged as predictors of readmission, and these include young age (coefficient =-0.07, std error=0.02, p=0.001), multiple admission (coefficient=-0.16, std error=0.04, p=0.000), longer length of stay (coefficient=-0.04, std error=0.18, p=0.04), and a diagnosis of schizophrenia (coefficient=-0.07, std error=0.03, p=0.04). Medication non-compliance was not predictive (coefficient=0.000, std error=0.01, p=0.1).

Discussion
Rate of readmissions

Within the study period, 41.4% were cases of readmission, a finding that conformed with previous studies that have reported rates between 14% and 86%[1,3,11,14-17] and an indication that an identifiable population of psychiatric patients continues to be rehospitalized. It therefore behoves mental health practitioners to attempt to predict those patients who are likely to be readmitted.

Predictors of readmissions

In the current study, the only socio-demographic variable predictive of readmission was young age, while the clinical variables predictive of readmission were longer length of stay,

Table III Logistic regression of significant variables			
Variables	coefficient	standard error	p-value
Age	-0.07	0.02	0.001
Length of stay	-0.04	0.18	0.04
Number of admissions	-0.16	0.04	0.000
Diagnosis of schizophrenia	-0.07	0.03	0.04
Medication compliance	0.000	0.01	0.1

a history of multiple admissions, and a diagnosis of schizophrenia. Medication non-compliance was not predictive of readmission, and possibly indicates the effectiveness and regularity of the follow-up treatment and family support available to patients after discharge. Out-patient commitment has been identified as an effective means of reducing relapse as it can substantially delay readmission.[4] Our finding was compatible with the findings of Chester[3] but contrary to those of other studies[2,4,18] that reported a positive and independent association.

The finding of high readmission in the younger age group was consistent with some reports that young patients were more likely to be readmitted[2,5,19] but contrary to others that reported no association.[3,4,11] A possible explanation for this finding could be that young patients are more likely to be residing with their parents (and thus directly under their supervision) who may take necessary action in the event of any relapse or exacerbation of psychopathology. This (unlike in the case of adults who might be living independently and thus refuse timeous treatment) could result in over-representation of young patients.

In the current study, long length of stay in hospital was also predictive of readmission. This has replicated the findings of

Table II. Correlation of significant variables						
		Age	Length of stay	Number of admission	Diagnosis	Medication non-compliance
Age	Pearson cor. Sig. (2-tailed) N	1 . 502	-0.057 0.199 502	0.224 0.000 502	-0.096* 0.031 502	0.092* 0.038 502
Length of stay	Pearson cor. Sig. (2-tailed) N	-0.057 0.199 502	1 . 502	0.108* 0.016 502	-0.13** 0.003 502	0.09* 0.04 502
Number of admissions	Pearson cor. Sig. (2-tailed) N	0.224 0.000 502	0.108* 0.016 502	1 . 502	-0.168 0.000 502	0.521** 0.000 502
Diagnosis	Pearson cor. Sig. (2-tailed) N	-0.096* 0.031 502	-0.13** 0.003 502	-0.168 0.000 502	1 . 502	-0.123** 0.006 502
Medication non-compliance	Pearson cor. Sig. (2-tailed) N	0.092* 0.038 502	0.092* 0.040 502	0.521** 0.000 502	-0.123** 0.006 502	1 . 502

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

some previous studies although some of these studies failed to state the direction of the relationship.[19-22] Long length of stay may imply the need for more treatment over a long period of time. This conjecture is bolstered by the finding of the predictive effects of a diagnosis of schizophrenia as well as a history of multiple admissions. Since this diagnostic category tends to be severe and more likely to run a chronic and deteriorating course, patients with schizophrenia are more likely to frequent psychiatric services and perhaps more likely to stay longer in hospital.

The association between multiple/previous admissions and recidivism has been reported previously[3,14,19] and is regarded as a rough measure of chronic or intermittently severe psychopathology. Patients with such psychopathology are at risk of exacerbations of illness. The finding of multiple admissions as a predictor of readmission may not be too surprising as it has been reported that persons who frequently seek psychiatric services often present with a range of complex, recurring problems that are not easily ameliorated, leaving these individuals vulnerable to further crises and hospitalization.[14] This assumption is further buttressed by the predictive effect of the clinical diagnosis of schizophrenia in the study- schizophrenia being a severe psychiatric disorder that more often than not runs a deteriorating course with every relapse or readmission. This perhaps, made this diagnostic group present for readmission more frequently, a finding that was similar to previous studies[8,9,16,20] but contrary to those that reported no relationship between diagnosis and readmission.[2,23]

Limitations
The traditional method of case filing, non-usage of file tags, and the resultant easy displacement of records made recording-keeping in the study center very difficult. This contributed to the problems of incomplete available data in this study. This may have affected the generalizability of the findings of this study.

The methodological differences between this study and some previous studies also precluded definitive comparisons. For instance, while some studies adopted operational definitions of readmission to be 3 or more admissions, this study adopted a definition of 2 or more admissions.

Conclusions
The findings suggest the need to dedicate special attention to young schizophrenic patients with multiple previous admissions in an attempt to decrease readmissions. This may include the provision of - psycho-education to both patients and their families with a view to improving the identification of early symptoms of relapse and help-seeking behaviour. There is an urgent need for improved record-keeping procedures by the health institutions in this country to facilitate retrieval of complete medical information about patients for necessary policy formulations.

However, it may not be sufficient to focus only on individual patients. Hospital-related issues that may contribute to readmission should also be identified and addressed. In particular, hospital policies and procedures for admissions and discharges, community-based services and the attitudes, expectations, and perceptions of hospital staff towards patients who relapse require further study.

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