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Risk factors for readmission among a cohort of psychiatric inpatients in Lilongwe, Malawi

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Abstract

Objectives—Inpatient psychiatric capacity is limited in Malawi and no published studies have assessed psychiatric readmissions there. Information about factors associated with readmission may help guide strategies to reduce readmission rates and keep patients stabilized in the community. Our goal was to determine factors associated with readmission among a cohort of psychiatric inpatients in Lilongwe, Malawi.

Methods—We conducted a retrospective chart review of all patients admitted to an inpatient psychiatric unit in Lilongwe, Malawi from January 1 to December 31, 2011. We used logistic regression to test for associations between readmissions during the study period and patient variables.

Results—419 patients were hospitalized during the study period. 29 patients (6.9%) were readmitted at least once during the study period. Readmission was associated only with intentional medication non-adherence at home (aOR: 3.33, p=0.02).

Conclusions—Intentional medication non-adherence is a potentially modifiable behavioral associated with psychiatric readmission. Efforts to improve medication adherence among patients following hospital discharge may help decrease the risk of readmission.

Keywords

Africa south of the Sahara; Malawi; mental disorders; mental health; psychiatry

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Declaration of interests

The authors declare no conflicts of interest.

Introduction

Given limited psychiatric inpatient capacity in sub-Saharan Africa, psychiatric readmissions present a considerable challenge to the region's health care delivery systems. The need for readmission may indicate that patients are not responding to treatment, are non-adherent with treatment, were discharged with inadequate aftercare preparation or were discharged into a community with insufficient outpatient aftercare options. It is important to identify patients who are likely to be readmitted, since those who are repeatedly readmitted are at risk for decreased quality of life, loss of economic independence, social isolation, unemployment, and divorce (Gbiri et al. 2011). Readmissions can also lead to financial and social burdens for family members, especially those who are female (Shibre et al. 2003), ultimately resulting in substantial repercussions for local economies.

Readmitted patients often make up a large proportion of psychiatric inpatient populations, including 42%–50% in South Africa (Gillis et al. 1985; Sandler & Jakoet 1985), 39% in Ethiopia (Fekadu et al. 2007) and 23% in Nigeria (Gbiri et al. 2011). Readmission rates among studies of psychiatrically hospitalized patients in South Africa range from 16–66% within one year of discharge (Levin et al. 1981; Sandler & Jakoet 1985; Tomita & Moodley 2016) to 46–50% within two years (Sandler & Jakoet 1985; Vally & Cader 2012), while a Nigerian study found that 41% of patients were readmitted within five years of discharge (Yussuf et al. 2008). A South African study found that of those readmitted, most were readmitted within one year of initial discharge (Vally & Cader 2012). An unpublished doctoral thesis authored in 2017 found that 2.4% of patients discharged from Zomba Mental Hospital (ZMH), Malawi's largest treatment facility, were readmitted within 30 days, while 9.5% were within six months and 18% were within twelve months (Kadzongwe 2017).

Studies throughout sub-Saharan Africa have shown the following factors to be associated with readmission: male gender (Gbiri et al. 2011), substance use (Gbiri et al. 2011), affective psychoses (Levin et al. 1981), schizophrenia (Levin et al. 1981; Yussuf et al. 2008), previous admissions (Sandler & Jakoet 1985; Yussuf et al. 2008; Gbiri et al. 2011; Pieterse et al. 2016; Kadzongwe 2017), lower education level (Pieterse et al. 2016), medication non-adherence (Smith 2005), and young age (Yussuf et al. 2008; Gbiri et al. 2011). The role of hospital length of stay as a predictor remains unclear, with two studies finding an association between longer length of stay and readmission (Niehaus et al. 2008; Yussuf et al. 2008), one not finding any association (Behr et al. 2002) and one finding an association with shorter length of stay (Kadzongwe 2017). Marriage and cohabitation are associated with decreased risk of readmission (Behr et al. 2002). A qualitative study of the perceptions of psychiatric nurses in South Africa about readmissions revealed beliefs that lack of family support, poor medication adherence, and substance use contributed the most to readmission (Nxasana & Thupayagale-Tshweneagae 2014).

We are unaware of peer reviewed research addressing psychiatric readmissions in Malawi. Therefore, the aim of our study was to investigate factors associated with readmission among a cohort of psychiatric inpatients in Lilongwe, Malawi in order to help address this important gap in the literature.

Methods

Study setting

The study was conducted at the Bwaila Psychiatric Unit (BPU) in Lilongwe, Malawi. Lilongwe is the capital of Malawi and has approximately one million residents. BPU is located on the grounds of Bwaila District Hospital but is administered by Kamuzu Central Hospital. The unit has 25 beds and a catchment area that encompasses 9 of the country's 28 administrative districts. Both men and women receive treatment at BPU. The unit population is primarily adult, but children are also treated there. At the time of this study nurses who had undertaken either an eighteen-month training course in psychiatric care delivered care at the unit, as no clinical officers or psychiatrists were employed there. However, the nurses received supervision regularly from clinical officers and a psychiatrist based at ZMH, Malawi's largest inpatient psychiatric facility. Treatment at BPU is provided according to Malawi's Mental Treatment Act (Chapter 34:02) of 1948 (Mental Health Treatment Act (Cap. 34:02) 1948). Healthcare is delivered free of charge to patients in Malawi and is funded by the government, as well as international donors. However, administering care on the unit is challenging due to limited resources and primarily consists of psychopharmacological management, which is sometimes complicated by an erratic medication supply.

Study design

We reviewed charts for all patients hospitalized at BPU between January 1st and December 31st, 2011. Charts were handwritten in English and were approximately five pages in length, varying from half a page to ten pages. Data describing patient demographic characteristics (age, gender, employment status, education level, relationship status, number of children, religious affiliation, etc.), diagnoses, number of previous psychiatric hospitalizations, medical comorbidities, location of residence, clinical outcomes, length of stay, medication non-adherence and other characteristics were extracted. Medication non-adherence was not able to be quantified in terms of number of days or doses missed, since the study was a chart review and these questions were not asked specifically by unit staff. Instead, intentional medication non-adherence was derived from admission note language through identification of phrases such as "patient stopped taking his medication" or "patient has been refusing to take his medication", while unintentional non-adherence was identified by phrases such as "patient ran out of his medications." Diagnoses were based on criteria in the International Classification of Diseases 10th revision (The ICD-10 Classification of Mental and Behavioural Disorders 1993). Data were entered into a REDCap electronic database hosted at Vanderbilt University (Harris et al. 2009).

Data Analysis

Charts were available for 419 patients admitted during the study period. Statistical analyses were conducted with Stata® version 12.0 (Stata Corporation, College Station, Texas, USA).

Pearson's chi squared test, Student's t-test and multivariate logistic regression were used to assess associations between readmission during the study period and patient variables. Patient variables were chosen based on findings in the medical literature and clinical

relevance. The multivariate model was checked to ensure that assumptions of logistic regression were met. Statistical significance was set at a p-value of <0.05.

Ethical approval

The study protocol was approved by the Malawi National Health Science Research Committee and the University of North Carolina, Chapel Hill Institutional Review Board.

Results

Patients had a mean age of 29.58 ± 9.49 years (range: 10–74) and were primarily male (302/414, 72.95%). Most patients were single (258/372, 69.35%), had at least one child (147/208, 70.67%) and lived in Lilongwe District (276/409, 67.48%). Average length of stay was 22.16 ± 28.07 days, with 21.82% (91/417) patients hospitalized longer than four weeks. Nearly all patients (386/410, 94.15%) were involuntarily hospitalized. The most common diagnoses on the unit were schizophrenia (30.07%, 126/419), cannabis use disorder (27.92%, 117/419), alcohol use disorder (25.06%, 105/419) and epileptic psychosis (7.16%, 30/419). Recent substance use (127/343, 37.03%), intentional medication non-adherence (108/343, 31.49%), seizures (29/343, 8.45%), interpersonal difficulties (23/343, 6.71%) and unintentional medication adherence (11/343, 3.21%) were the most frequently recorded events suspected by staff of contributing to patients' presentations. Patient demographics are further detailed in table 1.

The mean duration of symptoms for this episode of mental illness was 24.06 ± 72.16 days (range: 1.00–730.00 days), and the mean time since being first diagnosed with a psychiatric condition was 2.82 ± 5.16 years (range: 0.00–32.97 years). A majority of patients (206/347, 59.37%) had been psychiatrically hospitalized prior to the study period. The mean number of previous hospitalizations was 1.03 ± 1.60 (range: 0–10). The most common locations for hospitalizations prior to the study period were BPU (127/196, 64.80%) and ZMH (50/196, 25.51%), while 16.33% (32/196) of patients had been hospitalized elsewhere.

Twenty-nine patients (06.92%) were re-admitted during the study period. Twenty-six (89.66%) of these patients were readmitted once, two (6.90%) were readmitted twice and one (3.45%) was readmitted three times, for a total of 33 readmissions. Mean time to readmission among those readmitted was 114.66 ± 104.67 days (range: 1.00–350.00 days). Among those readmitted, diagnoses were: schizophrenia (37.93%, 11/29), alcohol use disorder (24.14%, 7/29), cannabis use disorder (17.24%, 5/29), epileptic psychosis (17.24%, 5/29), schizoaffective disorder (6.90%, 2/29) and other (24.13%, 7/29) [percentages total to more than 100% due to patients having multiple diagnoses].

Report of intentional medication non-adherence at home ($p < 0.01$) and diagnosis of epileptic psychosis ($p = 0.03$) demonstrated associations with readmission during the study period upon Chi squared analysis. However, upon multivariate logistic regression analysis, only report of intentional medication non-adherence at home ($p = 0.03$) was associated with readmission. No other statistically significant associations were observed on bivariate analyses (table 2) or multivariate analysis (table 3).

Discussion

This study is the first known peer-reviewed assessment of factors associated with psychiatric readmission in Malawi. The readmission rate of 6.92% during the one year study period is low compared to rates in South Africa (Levin et al. 1981; Sandler & Jakoet 1985; Tomita & Moodley 2016). This difference could be due to Malawi's lack of psychiatric facilities relative to South Africa. Given Malawi's dearth of facilities, approximately one third of patients hospitalized at BPU are from outside Lilongwe District. BPU's location in Malawi's largest city makes it a destination for many patients from the countryside, who travel long distances seeking care. Following their discharge, these prohibitive distances and associated costs likely impair patients' ability to return to BPU, despite the need for a readmission. Therefore, the low readmission rate may not accurately reflect the true need for readmissions among patients hospitalized at BPU.

BPU's readmission rate is also low compared to the rates of 9.5% within six months and 18% within twelve months found at ZMH in an unpublished 2017 study (Kadzongwe 2017). However, it should be noted that we explored readmission rates for a cohort of patients admitted and readmitted during a set one-year period. In contrast to the study at ZMH, we did not follow each patient for a year after their discharge. Therefore, comparison of rates to that study are not exact. Still, the readmission rate at BPU appears lower than that of ZMH. Because ZMH is the largest and most well-resourced psychiatric facility in the country, patients with the most severe--and thus readmission-prone--conditions are referred there from other districts. This difference in patient populations could explain the disparity in readmission rates.

Previous research at ZMH (Kadzongwe 2017) revealed associations between readmission and length of stay shorter than ten days, as well as having a larger number of previous psychiatric hospitalizations. However, our study did not find these associations. In addition to the different patient populations found at the two facilities, another possible explanation for this difference may have been the small number of patients in our sample who were readmitted. This may not have allowed for statistically adequate power to detect these associations.

Our analysis revealed an association between report of intentional medication non-adherence at home and readmission during the study period. This finding is in line with a qualitative study from South Africa (Smith 2005), but is in contrast to a quantitative Nigerian study which found no association (Yussuf et al. 2008). The reasons for a difference between our finding and that of the Nigerian study are unclear, but could be related to the fact that our study periods differed, with the Nigerian study looking at readmissions over a five-year span. The type of medication adherence in the Nigerian study was also not defined, so unintentional medication adherence may have been included in the analysis and impacted the results.

Intentional medication non-adherence is common among psychiatric patients, especially those with schizophrenia (Eticha et al. 2015), which was the most common diagnosis among this cohort. Our dataset did not allow us to determine reasons for intentional non-adherence (such as paranoia, cultural interpretations or side effects), though we were able to

differentiate intentional non-adherence from cases of unintentional non-adherence, such as when patients were taking their medications but ran out of them and were unable to obtain refills.

Poor medication adherence is often related to lack of outpatient follow up after hospital discharge. In general, outpatient follow up is poor among patients discharged from psychiatric hospitalization, with one South African study finding that only 21% of patients followed up at a clinic after discharge (Behr et al. 2002). Though some lack of outpatient follow up may be due to patients being unwilling to attend, research among Nigerian patients with schizophrenia has shown that frequent barriers to outpatient follow-up include lack of funds and long distances from patient residences to clinics (Adelufosi et al. 2013).

Cultural understanding of disease must also be considered. A study of South African nurses revealed opinions that cultural interpretations of disease often lead to patient medication non-adherence (Nxasana & Thupayagale-Tshweneagae 2014). Non-western interpretations of mental illness are common in sub-Saharan Africa, with a study in Nigeria demonstrating widespread beliefs, even among medical professionals, that mental illness is caused by evil spirits or sorcery and is treatable with prayer (Uwakwe 2007).

Several strategies have been studied to increase medication adherence among psychiatric patients. A South African study found that medication adherence was low among Xhosa patients and repeated verbal and written instructions did not increase adherence. However, a single home visit, during which instructions on how to appropriately take medications were given to patients, nearly doubled the adherence rate, indicating that patients may not have been aware of how to appropriately take their medications (Gillis et al. 1989).

Assertive treatment in the community, carried out by treatment teams that visit the patient's home, reduced the risk of readmission (Gillis et al. 1990; Botha et al. 2008; Botha et al. 2014), increased outpatient clinic attendance and saved the South African healthcare system money (Gillis et al. 1990). There is evidence from Denmark that this approach also increases medication adherence rates (Petersen et al. 2005). Despite these positive findings, implementing this and other types of community mental health care in sub-Saharan Africa remains difficult due to competing medical priorities and lack of funding (Hanlon et al. 2010). Given severe funding limitations in Malawi, the use of community health workers would provide the most realistic opportunity for implementing assertive mental health treatment. Zimbabwe has found already success through employing community health workers as part of the Friendship Bench program (Chibanda et al. 2015), which teaches patients how to identify psychological triggers and employ problem solving skills during stressful life events. Efforts are already underway to bring this program to Malawi (Udedi et al. 2019).

Adapting the directly observed treatment (DOT) model to mental health treatment has been shown to be beneficial in improving outpatient medication adherence (Pang et al. 2017). Given Malawi's success with DOT in the treatment of tuberculosis (Barnett et al. 2015), expanding its use to mental health may prove to be a feasible solution for the country. Long acting injectable antipsychotics (LAIs) have also been shown to increase adherence and

decrease hospital readmissions among patients with schizophrenia (Sacchetti et al. 2015). Though LAIs are more costly than oral medications, which often limits their use, over the long term they reduce cost through decreased hospitalizations (Correll et al. 2016). Although some LAIs, such as fluphenazine decanoate, were in use in Malawi at the time of this study, widespread shortage of supply limited their availability at BPU and elsewhere. Text message based efforts to increase medication adherence in patients with schizophrenia have also demonstrated efficacy (Montes et al. 2012).

Research in South Africa has shown that caregiver knowledge of aftercare arrangements following discharge is minimal, likely due to poor communication by staff at discharge (Koch & Gillis 1991). Families have also reported receiving insufficient information from treaters about aftercare treatment for the patient and how to manage the patient at home (Smith 2005). Patients at BPU would likely benefit from increased patient and family education at time of discharge. This education should focus on a medical explanation of psychiatric disease and symptoms, what the course of the patient's illness is likely to look like and the importance of medication adherence. Identification of medication side effects for caregivers and patients is also important, as well as encouraging the use of primary care and giving information on what symptoms of relapse look like and where to seek care. Improved record keeping within the psychiatric unit and in patients' medical passports would also help outpatient clinicians deliver more effective aftercare and ensure that patients are continued on the correct medications.

Limitations

This study's primary limitation is its retrospective design and the resulting missing data for some variables, which may have led to the use of data in our statistical modelling that is not an accurate representation of the entire unit population. However, data appeared to be missing randomly from charts, with no evidence of systematic absence of data for particular types of patients.

Conclusions

This is the first known published study looking at factors associated with readmission among psychiatric inpatients in Malawi. An association between intentional medication non-adherence and readmission was observed. New strategies to improve medication adherence in the community should be investigated as a means of reducing readmissions and keeping patients at home in Malawi.

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Key points

- The prevalence of readmission among psychiatric inpatients in Lilongwe, Malawi was 6.9% during the one-year study period.
- Readmission was associated with intentional medication non-adherence at home.
- Future research efforts in Malawi should focus on improving medication adherence among psychiatric patients in the community to help decrease rates of readmission.

Table 1.

Description of patient demographics

Variable		N (%)
Gender (n=414)		
	Male	302 (72.95)
	Female	112 (27.05)
Marital status (n=372)		
	Single	258 (69.35)
	Married	114 (30.65)
Education (n=257)		
	None	12 (4.67)
	Completed Standard 8 or less	131 (50.97)
	Completed Form I, II, III or IV	103 (40.08)
	Any university	11 (4.28)
Employment type (n=318)		
	No formal employment	102 (32.08)
	Farmer	60 (18.87)
	Laborer	43 (13.52)
	Vendor	37 (11.64)
	Student	34 (10.69)
	Domestic worker	22 (6.91)
	Other	20 (6.29)
Place of residence (n=409)		
	Lilongwe District	276 (67.48)
	Other district in Malawi	130 (31.78)
	Other country	3 (0.73)
Religion (n=359)		
	Christian	279 (77.72)
	Traditional	53 (14.76)
	Muslim	22 (6.13)
	Atheist	1 (0.28)
	Other	4 (1.11)
Admission status (n=410)		
	Voluntary	24 (5.85)
	Involuntary	386 (94.15)
Psychiatric diagnoses * (n=419)		
	Schizophrenia	126 (30.07)
	Cannabis use disorder	117 (27.92)
	Alcohol use disorder	105 (25.06)

Variable		N (%)
	Epileptic Psychosis	30 (7.16)
	Major depressive disorder	28 (6.68)
	HIV associated psychosis	12 (2.86)
	Other psychotic disorder	47 (11.22)
	Other non-psychotic disorder diagnosis	45 (10.74)
Psychiatrically hospitalized prior to study period (n=347)		
	Yes	206 (59.37)
	No	141 (40.63)
Outcome (n=417)		
	Stabilized and discharged home	284 (68.10)
	Transferred to another hospital	81 (19.42)
	Discharged against medical advice	34 (8.15)
	Absconded	14 (3.36)
	Died	4 (0.96)

* Percentage sums to greater than 100% due to some patients with multiple diagnoses.

Table 2.

Bivariate analyses of patient variables and readmission

Variables	Whole sample % (n/N)*	Readmitted % (n/N)*	Not readmitted % (n/N)*	P-value
Age under 20 years	14.94 (59/395)	10.71 (3/28)	15.26 (56/367)	0.52
Alcohol use disorder	25.06 (105/419)	24.14 (7/29)	25.13 (98/390)	0.91
Cannabis use disorder	27.92 (117/419)	17.24 (5/29)	28.72 (112/278)	0.18
Epileptic psychosis	7.16 (30/419)	17.24 (5/29)	6.41 (25/390)	0.03
Female Gender	27.05 (112/414)	37.93 (11/29)	26.23 (101/385)	0.17
Length of stay <10 days	66.43 (277/417)	62.10 (18/29)	66.75 (259/388)	0.61
Married	30.65 (114/372)	34.62 (9/26)	30.35 (105/346)	0.65
Medication non-adherence	25.78 (108/419)	48.28 (14/29)	24.10 (94/390)	<0.01
Number of psychiatric ** hospitalizations	1.03 ± 1.60	1.30 ± 2.12	1.01 ± 1.55	0.39
Residence in Lilongwe	65.87 (276/419)	58.62 (17/29)	66.41 (259/390)	0.39
Schizophrenia diagnosis	30.07 (126/419)	37.93 (11/29)	29.49 (115/390)	0.34
Voluntary admission status	5.85 (24/410)	10.71 (3/28)	5.50 (21/382)	0.26

* Total number of patients per variable varies slightly due to missing data.

** Mean ± standard deviation given rather than percentages

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Table 3.

Multivariate logistic regression of patient variables and readmission

Variables	Coefficient (S.E.)	Odds ratio (95% CI)	P-value
Age under 20 years	0.15 (0.73)	1.17 (0.28–4.88)	0.83
Alcohol use disorder	0.69 (0.72)	2.00 (0.49–8.27)	0.34
Cannabis use disorder	−0.61 (0.78)	0.55 (0.12–2.50)	0.44
Epileptic psychosis	1.35 (0.82)	3.84 (0.77–19.10)	0.10
Female gender	1.01 (0.57)	2.74 (0.90–8.32)	0.08
Length of stay <10 days	−0.35 (0.52)	0.71 (0.25–1.98)	0.51
Married	−0.23 (0.56)	0.80 (0.27–2.38)	0.68
Medication non-adherence	1.18 (0.53)	3.26 (1.16–9.15)	0.03
Number of psychiatric hospitalizations	0.19 (0.15)	1.21 (0.90–1.63)	0.20
Residence in Lilongwe	−0.31 (0.52)	0.73 (0.26–2.04)	0.55
Schizophrenia diagnosis	−0.41 (0.65)	0.66 (0.18–2.37)	0.53
Voluntary admission status	1.14 (0.91)	3.11 (0.52–18.51)	0.21
Constant	−3.15 (0.78)	0.04 (0.01–0.20)	0.00

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