

ORIGINAL PAPER

The Prevalence and Associated Factors of Psychiatric Early Readmission in a Teaching Hospital, Malaysia

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Abstract

Objective: The aim of the study was to determine the early readmission rate among the psychiatric patients discharged from a teaching hospital in Malaysia. The associated factors were also examined. **Methods:** This is a prospective and observational study. The socio-demographic and clinical data of 202 patients from the psychiatric ward were collected on discharge along with the administration of instruments including Brief Psychiatric Rating Scale (BPRS), Life Events Questionnaire (LEQ), and Multidimensional Scale of Perceived Social Support (MSPSS). Assessment of compliance to medication and substance use was reliant on self-report data. Medication compliance was categorized as “poor” vs “good”, whereas poor compliance was the complete discontinuation of medication for at least two weeks. The patients were followed up to determine whether they were readmitted within 6 months. **Results:** At the end of 6 months follow-up, 32.2% of the subjects were readmitted. Univariate regression analysis indicated that patients with psychotic disorder, past episodes, previous admission, poor compliance, on conventional or depot injectable antipsychotic and higher BPRS scores on discharge were significantly associated with early readmission ($p < 0.05$). Multivariate Logistic analysis identified that poor compliance was the only significant predictor of early readmission ($p < 0.05$). **Conclusion:** Early readmission is highly prevalent in psychiatric patients. Poor compliance to medication is the most important factor related to early readmission. Measures to improve compliance to medication are required to reduce psychiatric readmission.

Keywords: Readmission, Psychiatry, Risk Factors, Medication, Malaysia

Introduction

Mental disorder accounts for nearly 12% of the global burden of diseases. Based on a

report from World Health Organization (WHO), by 2020, mental disorder will account for nearly 15% of disability-adjusted life-years lost to illness¹.

Developing countries are likely to see a disproportionately large increase in the burden attributable to mental disorder in the coming decades¹.

Shortage of psychiatric beds remains a problem which exists in many parts of the world. The situation is even more critical in developing countries. The demand of limited number of psychiatric beds in hospitals is becoming an increasing pressure, along with the rapid growth of the need for psychiatric services^{2,3}. This may put pressure on the psychiatric unit to discharge patients early. The resultant premature discharge may lead to increase in readmissions.

Psychiatric readmission in a short period of time following discharge is undoubtedly an undesirable event. It increases the cost of the health care system and workload of the mental health care workers⁴. Often these episodes require involuntary hospitalization and trigger the involvement of police, emergency rooms, inpatient units and various types of services⁵. It is estimated that the repeat admissions may be responsible for up to 60% of hospital expenditure. Readmission is a painful experience for the patients and their families. The cost of multiple admissions to the patients and their relatives in terms of distress, morbidity and mortality is immeasurable. It has been reported that the more relapses, the poorer the prognosis and long term outcome for patients with mental disorders like schizophrenia⁶.

It is reported that readmissions may be responsible for up to half of all hospital admissions^{7,8}. While there is vast literature examining readmission among those who are chronically mentally ill^{9,10,11,12}, only a small number of reports have addressed the phenomenon of early readmission despite

the fact that it is as high as 30% of all discharged patients.

To date, there are limited studies on psychiatric readmission in Malaysia. Under the current climate, understanding the relationship of hospital outcome to readmission is particularly important. In order to address this matter, this study aims to determine the psychiatric early readmission rate in a teaching hospital in Malaysia. It also examines the association of patient's socio-demographic factors, clinical conditions, prescriptions of atypical antipsychotic, medication non-compliance and perceived social support prior to discharge, with early readmission. The identification of factors associated with early readmission will be useful for future care strategy design aimed at both cost containment and improved quality of care in patients with mental disorder.

Methods

Ethical approval was obtained from the Medical Committee, UMMC. The confidentiality of the participants was assured and the purpose of this study was explained to the participants. Written consents were obtained from all the participants for this study.

Study Setting and Design

This is a prospective observational study conducted in the psychiatric ward of University Malaya Medical Centre (UMMC). UMMC is located at the border of Kuala Lumpur (KL) and Petaling Jaya (PJ) cities. The catchment area for PJ population last stands at 450,000. They are composed of mainly Chinese descendants, urbanized and middle income group.

The study used universal, convenient sampling method to recruit a series of non-duplicated, consecutive patients who were discharged from the psychiatric ward from 27th Aug 2007 to 15th Apr 2008. Assessment was carried out on patients prior to their discharge. Patients who were diagnosed with any mental illness and consented to be recruited were included in the study. However patients admitted for clinical drug trials and admitted for maintenance electro-convulsive therapy were excluded.

All patients who were discharged during the study period were approached and explained regarding the study. Patient Information Sheets were provided. They were given adequate period of time to consider to participate in the study. The patients were reassured of their confidentiality and that no identification data would be revealed in the final report. Those who gave their consent were recruited in the study.

The investigator confirmed the diagnosis of the patients with their respective treating psychiatrists based on the DSM-IV criteria. The socio-demographic and relevant clinical data were then obtained, including age, sex, race, marital status, level of education, occupation, first onset, number of previous admission, date of last admission, period of stay for current admission, treatment received (i.e., conventional or atypical antipsychotic medication, depot injection and electroconvulsive therapy) and substance use.

Recent life events were assessed with the Life Events Questionnaire (LEQ) whereas perceived psychosocial support was measured using Multidimensional Scale of Perceived Social Support (MSPSS). General psychopathology of the patients was

assessed using Brief Psychiatric Rating Scale (BPRS).

All recruited patients were followed up for six months after discharge. Any of them who were readmitted in less than 6 months would be identified. The interval period from index discharge was recorded. For those who were not readmitted within 6 months, were contacted by phone or identified in the psychiatric clinic, UMMC and the follow up assessment was carried out. On follow up assessment, the patients were checked on their compliance to treatment. Compliance to medication was based on self-report data (defined as missing medication as prescribed for 2 consecutive weeks or more)^{40,41}.

Instruments

Brief Psychiatric Rating Scale (BPRS-24)

The BPRS was developed by JE Overall and DR Garham in the early 1960s^{13,14,15}. It is the most established questionnaire scale for rapid clinical assessment that measures major psychotic and non-psychotic symptoms in individuals with major psychiatric disorders. The version of 24 items was adapted by Ventura¹⁶ et al in 1993. The rating is based on the observations made by the clinician or rater during a 15- to 30-minute interview (items which measure tension, emotional withdrawal, mannerisms and posturing, motor retardation and uncooperativeness), and subject verbal report (items which measure conceptual disorganization, unusual thought content, anxiety, guilt feeling, grandiosity, depressive mood, hostility, somatic concern, hallucinatory behaviour, suspiciousness and blunted affect). Additional to the scale were eight additional items of suicidality, elated mood, bizarre behaviour, self-neglect, disorientation, excitement, distractibility,

motor hyperactivity. Each item is defined by 1-2 sentences of clinical description. The scale points range from 1 to 7, defining from “not present” up to “extremely severe”.

Life Events Questionnaire (LEQ)

The LEQ was developed by TS Brugha¹⁷ in 1990. It is a 12 item self-rated instrument measuring common life events that tend to be threatening. The list of the 12 stressful life events include: personal suffering from a serious illness, injury or assault; a close relative suffering from a serious illness, injury or assault; death of a parent, spouse/partner, child, brother or sister; death of a close family friend or another relative; marital separation; break-up of steady relationship; serious problem with a close friend, neighbour or relative; redundancy/sacking from job; unsuccessfully seeking work for more than 1 month; major financial crisis, such as losing the equivalent of 3-month income; problems with the police involving in a court appearance; something valued being lost or stolen. Each item may be scored 1 if it is checked and 0 if not. A total score would be the sum of all items. The test-retest reliability was reported as 0.84 for a three month period and 0.66 for a six month period. Concurrent validity ranged from a Kappa of 0.70 to 0.90 depending on whether the 6 or 3 month period is considered prior to measurement¹⁸. The reliability of the Malay version of LEQ was reported in the previous study¹⁹.

Results

Table 1. Socio-demographic and clinical characteristic of the patients (N=202)

<i>Socio-demographic Characteristic</i>	Mean (SD)
Age	39.12 (13.64)
	n (%)
Sex	

Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS was developed by Zimet GD²⁰ in 1988. It is an instrument which specifically addresses the subjective assessment of social support adequacy. It is a 12-item self-rated instrument designed to assess perceptions of social support from three specific sources: family, friends and significant other. The MSPSS assesses the extent to which respondents perceive social support from each of those sources and is divided into three subscales: family (items 3,4,8,11); friends (items 6,7,9,12) and significant other (items 1,2,5,10). It uses a 7-point Likert type response format (1=very strongly disagree, 7=very strongly agree)¹⁸. The validity and reliability of the Malay version of MSPSS was established in the previous study²¹.

Measurement of Early Readmission

The numerator for a readmission rate was defined as the number of readmissions in 6 months after an index discharge from the psychiatric ward, UMMC. The denominator was defined as the corresponding number of patients discharge within the study period²².

Formula:

$$\text{Early Readmission Rate} = \frac{\text{Number of readmission within 6 months interval of previous index discharge}}{\text{Number of discharge within the study period}}$$

Male	92 (45.5)
Female	110 (54.5)
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Race	
Malay	45 (22.3)
Chinese	92 (45.5)
Indian	57 (28.2)
Others	8 (4.0)
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Marital Status	
Single	101 (50.0)
Married	85 (42.1)
Separated	7 (3.5)
Divorced	8 (4.0)
Widow	1 (0.5)
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Educational Level	
Nil	2 (1.0)
Primary	24 (11.9)
Secondary	106 (52.5)
Tertiary	70 (34.7)
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Employment	
No	110 (54.5)
Yes	92 (45.5)
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<i>Clinical Characteristic</i>	
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Diagnosis	
Psychotic disorder	73 (36.1)
Bipolar Disorder	46 (22.8)
Major Depressive Disorder	47 (23.3)
Others	36 (17.8)
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First Onset	
Yes	61 (30.2)
No	141 (69.8)
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Type of antipsychotic use	
Conventional	18 (8.9)
Atypical	110 (54.5)
Mixed	17 (8.4)
Nil	57 (28.2)
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Type of depot medication use	
Conventional	21 (10.4)
Atypical	2 (1.0)
Nil	179 (88.6)
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Electroconvulsive therapy use	
Yes	42 (20.8)
No	160 (79.2)
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Length of stay	
< 15 days	156 (77.2)
≥ 15 days	46 (22.8)
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Compliance to treatment	

Yes	91 (45.0)
No	95 (47.0)
Not applicable	16 (7.9)
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Substance use	
Yes	27 (13.4)
No	175 (86.6)
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Life Threatening Events	
Nil	91 (45.2)
At least one event	111 (54.8)

A total of 202 patients were recruited for the study. The average age was 39.1 years (range = 16-88 years). Female accounted for 54.5% of the samples and male 45.5%. The study group were predominantly Chinese, single and achieved secondary education level. Most of the patients were unemployed or students.

Most of the patients were admitted with a primary diagnosis of psychotic disorder. Of the 202 samples, 30.2% were having the first onset during the index admission. Most of the patients stayed less than 15 days in the ward. The co-morbid use of substance was only found in 13.4% of the sample. The majority of the patients were treated with atypical antipsychotic drugs. 28.2% of the patients were not on any psychotropic medication. About one fifth of the samples

were given electro-convulsive therapy and 11.4% were given depot injectable antipsychotic. Almost half of the samples were poorly compliant to the medications. 16 patients were not assessed for compliance to medication as they were not on any treatment at discharge. More than half of the patients were reported to have experienced at least one stressful life event in the past six months (Table 1).

The mean score of the MSPSS for the subjects was in the direction of good social support (mean=56.24, sd=16.37). The median BPRS score for the subjects was 36 (mean = 39.07, sd=11.74, range = 17-78). This reflected on average a moderate level of psychiatric symptomatology among the patients at discharge.

Table 2. Univariate analysis of the factors associated with early readmission

Variable	Readmission, n (%)		χ^2 (df=1)	OR (95% CI)	P value
	Yes	No			
Sex					
Male	30 (32.6)	62 (67.4)	0.01	1.04 (0.57-1.88)	0.91
Female	35 (31.8)	75 (68.2)			
Age					
< 40 years	36 (32.7)	24 (67.3)	0.03	1.06 (0.58-1.91)	0.86
≥ 40 years	29 (31.5)	63 (68.5)			
Race					
Malay	15 (33.3)	30 (66.7)	0.35	1.07 (0.53-2.17)	0.85
Non Malay	50 (31.8)	107 (68.2)			
Marital Status					

Never married	35 (34.7)	66 (65.3)			
Married	30 (29.7)	71 (70.3)	0.57	1.26 (0.70-2.27)	0.45
Educational Level					
Less than secondary	10 (38.5)	16 (61.5)			
Secondary and above	55 (31.3)	121 (68.8)	0.54	1.38 (0.59-3.22)	0.46
Occupation					
Unemployed	40 (36.4)	70 (63.6)			
Employed	25 (27.2)	67 (72.8)	1.94	1.53 (0.84-2.80)	0.16
Previous life events					
Yes	32 (28.3)	81 (71.7)			
No	33 (37.1)	56 (62.9)	1.75	0.67 (0.37-1.21)	0.19
Diagnosis					
Psychotic disorder	30 (41.1)	43 (58.9)			
Non psychotic disorder	35 (27.1)	94 (72.9)	4.16	1.87 (1.02-3.44)	0.04*
First onset					
Yes	13 (21.3)	48 (78.7)			
No	52 (36.9)	89 (63.1)	4.73	0.46 (0.23-0.94)	0.03*
Length of stay					
< 15 days	51 (32.7)	105 (67.3)			
≥15 days	14 (30.4)	32 (69.6)	0.08	1.11 (0.55-2.26)	0.77
Use of ECT					
Yes	13 (31.0)	29 (69.0)			
No	52 (32.5)	108 (67.5)	0.04	0.93 (0.45-1.94)	0.85
Substance use					
Yes	12 (44.4)	15 (55.6)			
No	52 (30.2)	120 (69.5)	2.16	1.85 (0.81-4.22)	0.14
Compliance					
Yes	21 (23.1)	70 (76.9)			
No	43 (45.3)	52 (54.7)	10.14	0.36 (0.19-0.68)	<0.01*
Use of atypical antipsychotic					
Yes	39 (30.7)	88 (69.3)			
No	11 (61.1)	7 (38.9)	6.45	0.28 (0.10-0.78)	0.01*
Previous admission					
No	21 (23.1)	70 (76.9)			
Yes	44 (39.6)	67 (60.4)	6.29	0.46 (0.25-0.85)	0.01*
Use of depot					
Yes	14 (60.9)	9 (39.1)			
No	51 (28.5)	128 (71.5)	9.79	3.90 (1.59-9.58)	<0.01*
	mean (sd)	mean (sd)	t	95% CI of mean difference	

BPRS	43.72 (14.57)	36.86 (9.42)	4.02	(3.50, 10.22)	<0.01 *
MSPSS	56.72 (15.44)	56.04 (16.81)	0.27	(-4.33, 5.70)	0.79

df = degree of freedom

OR = odds ratio

BPRS = brief psychiatric rating scale

MSPSS = multidimensional scale of perceived social support

* p < 0.05

Of total, 65 patients (32.18%) were readmitted within six months after being discharged from the psychiatric ward. Table 2 shows the univariate analysis of the factors associated with the early readmission. Socio-demographic characteristics such as gender, age, race, marital status, education level and employment were not associated with early readmission. Clinical factors such as diagnosis of psychotic disorder, poor compliance to medication, not the first onset during the index admission, history

of previous admission were associated with early readmission. The patients on conventional antipsychotic or depot medications had higher odds of early readmission. Length of stay, use of electroconvulsive therapy and substance use were not associated with early readmission among the subjects. Early readmitted patients had higher score on BPRS at discharge. Patients' perceived social support was not associated with readmission.

Table 3. Multivariate analysis of predictor variable for early readmission using Logistic regression

Variables	Category	Adjusted OR (95% CI)	P value
Diagnosis	Psychotic disorder*		
	Non psychotic disorder	1.33 (0.62-2.84)	0.47
First onset	Yes*		
	No	1.13 (0.35-3.66)	0.84
Previous admission	Yes*		
	No	0.61 (0.22-1.70)	0.35
Use of atypical antipsychotic	Yes*		
	No	0.79 (0.22-2.85)	0.71
Use of depot medication	Yes*		
	No	2.67 (0.85-8.35)	0.09
Compliance	Yes*		
	No	0.38 (0.17-0.81)	0.01**

BPRS score	< 36*		
	≥ 36	0.82	(0.39- 0.60 1.72)

* Reference category ** $p < 0.05$

Logistic multivariate regression analysis was performed using the variables which were shown to be significant in the univariate analysis ($p < 0.05$). Table 3 shows that compliance to medication was the only independent factor associated with early readmission within six months.

Discussion

The current study examined the rate of early readmission among 202 psychiatric patients who were discharged from the psychiatric ward, University Malaya Medical Centre (UMMC), Malaysia. The findings showed that 32.18% of the patients were readmitted within six months after discharged. The only associated factor with early readmission was poor compliance to medications, which was defined as missed medication for two weeks or more in the study.

Readmission is commonly used as an outcome or quality indicator for psychiatric inpatient services^{23,24}. Hospital readmission, particularly when it occurs within relatively short time after previous discharge, is often seen as a failure of the earlier hospital admission.²⁵ In Malaysia, early readmission (within 6 months) is used as one of the 2 National Indicators in Psychiatry (NIP-2). The first indicator is the number of mortality (NIP). Readmission rate has been proposed as the quality indicator for psychiatric services in other countries. In England, a specific performance indicator of reducing emergency psychiatric readmission to 12% by 2002 had been set in the past²⁶. In the current study, the rate of early readmission was relatively high as compared to the

previous study on chronic mentally ill patients^{9,10,11,12}. Premature discharge due to shortage of beds and the increased need of psychiatric services may be responsible for the high readmission rate²⁷.

Several factors were identified to be associated with psychiatric readmission in the previous studies. The relation between socio-economic status and admissions to hospital for mental illness has been recognized for decades.²⁸ However, in the current study, it appeared that there was no statistical significant relationship between socio-demographic status with early readmission. This was similar to the finding by Dixon et al²⁹ and Lyons et al²⁵ in 1997. Surprisingly unemployment was not a significant predictor of readmission in the current study. In contrast, Dekker et al³⁰ (1997) reported a positive correlation in Amsterdam. Kammerling and O'Connor³¹ (1993) also reported that unemployment rates were an extremely powerful indicator of the rates of serious mental illness that would need treatment in hospital in those aged below 65 years. The lack of association of early readmission with socio-economic variables may indicate that illness-specific variables are more important determinants of readmission³².

In the result of current study, the author identified six variables (higher BPRS discharge score, not the first onset during index admission, poor compliance to medication, use of conventional antipsychotic drugs, previous history of admission and use of depot injectable antipsychotic) were significantly associated with early readmission in univariate

analysis. However, after adjusting for the covariates in multivariate analysis, non-compliance was the only significant factor associated with psychiatric early readmission. In contrast, variables like median BPRS discharge score, use of atypical antipsychotic, depot injectable antipsychotic, first onset of illness and history of previous admission did not maintain their predictive capacity in multivariate analysis. This suggested that these variables were manifestations of maladaptive pattern of behaviour which led to poor compliance of medication rather than independent contributors to poor outcome.

Compliance was defined as the extent to which the patient's behaviours, in terms of taking medications, following diets, or executing lifestyles changes, coincide with the clinical prescriptions³³. Non adherence to medication was one of the major problems faced in the treatment of psychiatric illness. Poor adherence to medication was reported as 55% in the current study. Although the rate was within the reported range of non-adherence of 27%-90% in the previous studies³⁴, it was much lower than the reported rate of 74% in medication discontinuation in the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) done by Lieberman et al, 2005³⁵. Deviation from maintenance antipsychotic treatment put patients at risk of exacerbation of psychosis and emergency room visit. Medication non adherence was also reported in other studies as an important predictor of readmission^{36,24}. There has been growing interest in studying compliance behaviour which has been propelled by two factors: an exponential growth in the development and testing of new therapeutic agents, and the growing burden of chronic diseases that require reliance on life-long medical treatment³⁷). There has been a

general consensus that long-term maintenance antipsychotic treatment remains the most reliable means of preventing relapse, minimizing mortality and morbidity, and enduring independent living and longer community tenure in people treated for schizophrenia^{38,39}. However, treatment adherence remains a significant problem in the long term care of schizophrenia³⁷.

The result of the current study should be interpreted in the context of a few potential methodological limitations. The study subjects were recruited from a single centre. The results may not be generalizable to other settings. The assessment of compliance to medication and substance use were reliant on self-report data which carried the risk of information bias. The information of other important factors that might be associated with early readmission in psychiatric patients such as expressed emotion among the family member was not collected in this study.

In conclusion, early readmission is high among psychiatric patients. Poor adherence to medication is associated with psychiatric early readmission. If the treatment program seeks to decrease the incidence of early readmission, greater attention must be paid to help the patients to recognize their own symptoms and understand their illness with the aim to improve medication adherence.

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