

Original article

Determination of factors associated with early readmission of patients with mental illness in two cities in Colombia during 2018



Manuel Alejandro Pinzón Olmos^{a,*}, Carolina Cortés Duque^a, Tania Pinzón Olmos^b, Rafael Arias Duarte^c

^a Centro de Rehabilitación Integral de Boyacá (CRIB), Tunja, Colombia

^b Universidad de Boyacá, Tunja, Colombia

^c Universidad Pedagógica y Tecnológica de Colombia, Tunja, Colombia

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ABSTRACT

Introduction: Early rehospitalisation in mental health units (SMHUs) is when a patient needs to be readmitted in the first 30 days after receiving discharge, and is mainly due to recurrent decompensation of their mental illness. This phenomenon is related to a worse prognosis and has an impact on the family, social and work environment. Absenteeism from work and additional hospital time are expenses for the health and employment system which have made rehospitalisation a phenomenon of special interest. The present study was carried out with the objective of exploring the factors associated with the readmission of patients with psychiatric illnesses treated in two MHUs during 2018, as well as those modifiable factors that act as protection for this condition.

Methods: Observational, descriptive study with analytical component of cases and controls in two MHUs in different cities of Colombia. Information was obtained by collecting data from the medical records of patients who were admitted between 1 January 2018 and 31 December 2018. The data were collected between 20 February and 27 May 2019. The sample was composed of all the patients who met the criteria for early readmission in both institutions. The study group consisted of 113 patients: (28 cases and 85 controls), matched by the variables: age, sex, place of hospitalisation and diagnosis.

Results: In the two hospital MHUs the diagnoses found were: depression (15.5%), bipolar affective disorder (33.1%) and schizophrenia (37.3%). In Bogotá, the most prevalent was depression (31.1%) and, in Tunja, it was schizophrenia (44.8%). For both institutions, the factor most associated with readmission was alcohol consumption, but other variables of treatment, family nucleus, and individual intervention were also associated with a greater probability of early readmission.

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* Corresponding author.

E-mail address: manuelpinzon523@gmail.com (M.A.P. Olmos).

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Conclusions: It was possible to demonstrate that the use of atypical and/or depot antipsychotics, hospitalisations longer than 15 days, and prescriptions of less than three drugs at discharge, reduce the number of early readmissions to MHUs.

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Determinación de los factores asociados con el reingreso temprano de pacientes con enfermedad mental en dos ciudades de Colombia durante 2018

R E S U M E N

Palabras clave:

Reingreso del paciente
Factores de riesgo
Trastornos mentales
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Introducción: La rehospitalización temprana en unidades de salud mental (USM) es la necesidad de hospitalización de un paciente en los primeros 30 días tras el alta, principalmente por descompensación recurrente de su enfermedad mental. Este fenómeno se relaciona con un peor pronóstico y tiene impacto en el entorno familiar, social y laboral. El ausentismo laboral y las estancias hospitalarias adicionales son gastos para el sistema de salud y de empleo que han hecho de la rehospitalización un fenómeno de especial interés. El presente estudio se llevó a cabo con el objetivo de explorar los factores asociados con el reingreso de los pacientes con enfermedad psiquiátrica atendidos en 2 USM en 2018, así como aquellos modificables que actúen como protección contra esta condición.

Métodos: Estudio observacional descriptivo con componente analítico de tipo casos y controles en 2 USM de distintas ciudades de Colombia. Se obtuvo información por medio de una ficha de recolección de datos tomados de los registros de historias clínicas de los pacientes que ingresaron entre el 1 de enero y el 31 de diciembre de 2018. La recolección de datos se hizo del 20 de febrero al 27 de mayo de 2019. Compusieron la muestra todos los pacientes que cumplían los criterios de reingreso temprano en ambas instituciones. El grupo de estudio estuvo conformado por 113 pacientes: 28 casos y 85 controles, emparejados por las variables edad, sexo, lugar de hospitalización y diagnóstico.

Resultados: En las 2 USM hospitalarias, los diagnósticos encontrados fueron: depresión (15,5%), trastorno afectivo bipolar (33,1%) y esquizofrenia (37,3%); en Bogotá la más prevalente fue la depresión (31,1%) y en Tunja, la esquizofrenia (44,8%). Para ambas instituciones, el factor que más se asocia con el reingreso es el consumo de alcohol, pero otras variables de tratamiento, núcleo familiar e intervención individual también se asociaron con mayor probabilidad de reingreso temprano.

Conclusiones: Se pudo demostrar que el uso de antipsicóticos atípicos y/o de depósito, las hospitalizaciones de más de 15 días y la prescripción de menos de 3 medicamentos al alta disminuyen el número de reingresos tempranos en las USM.

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Introduction

Early rehospitalisation on mental health units (MHUs) refers to the need to hospitalise a patient within 30 days of prior discharge, primarily due to recurring decompensation of their mental illness^{1,2}. This phenomenon is linked to a worse prognosis and has repercussions for familial, social and occupational settings. Absenteeism in the workplace and additional hospital stays represent health system-related and occupational expenses, rendering rehospitalisation a phenomenon of special interest. Also, rates of rehospitalisation make it possible to draw inferences as to mental health outpatient care quality after discharge²⁻⁵.

Approximately one third of patients with chronic disease have at least one early rehospitalisation^{2,6}, although some studies perform readmission follow-up for up to 90 days after discharge and have documented rates as high as 66%, with a predominance in the first year following hospitalisation^{2,6,7}. With identification of and intervention in modifiable risk factors, there is a greater opportunity to decrease rehospitalisations, patient deterioration and chronicisation of limitations, and thus improve quality of life among users of mental health services^{5,8}.

In the Latin American and Colombian context, health systems have particular characteristics that have worked against stable management of chronic mental illnesses, such as administrative pressure to shorten hospital stays and dif-

faculties with getting medicines from insurers^{5,7,8}. Various clinical and sociodemographic factors have been linked to the phenomenon of rehospitalisation, including non-compliance with follow-up appointment schedules and drug treatment, higher numbers of prior hospitalisations, short hospital stays, early disease onset, pathological alcohol consumption and addictive substances, diagnosis of schizophrenia or schizoaffective disorder, disease course and personality and anxiety disorders^{2,6,8-10}.

Other studies with systematic literature reviews have reported as many as 59 associated factors between individual, post-treatment, health-department and social-context factors; among these were individual factors, which predominated with 37; 30 post-treatment factors; 21 health-department factors; and seven social-context factors^{2,6,9,11}.

Some studies have found that including family members in treatment may reduce risks of rehospitalisation; however, there does not appear to be a consensus on what would be the most suitable strategy for this^{7,12,13}. Other protective factors reported are: low levels of expressed emotion, use of community-based care systems and use of psychoeducation strategies^{2,6,14}. Ongoing interest in intervening in mental health with alternatives to hospitalisation such as day hospitals and outpatient follow-up seeks to ensure that hospital units are reserved for situations of strict necessity with resource use optimisation^{6,14}.

This study was conducted with the objective of determining factors associated with readmission in patients with psychiatric disease seen on two MHUs in Colombia in 2018, as well as modifiable factors acting as protection against this condition.

Methods

This observational, descriptive, case-control study with an analytical component was conducted on two MHUs in different cities in Colombia. Information was collected using a sheet for collecting data from the electronic medical records of patients admitted between 1 January and 31 December 2018. Data collection was done between 20 February and 27 May 2019.

Convenience sampling was performed on all patients recorded as early readmissions, whose prevalence was 30%^{4,6,15}; in the methodology design, three controls were taken for every one case. The study group consisted of 113 patients with different psychiatric diseases who were admitted in 2018; 28 cases and 85 controls were selected according to the following variables: age, sex, hospitalisation site and diagnosis.

The cases were patients hospitalised on the dates determined for the study and rehospitalised within 30 days (inclusive) following discharge, aged 18-70, with a recorded admission to the unit between 1 January and 31 December 2018. The controls were patients hospitalised in the period established for the study who did not need to be rehospitalised within 30 days of discharge (as of day 31), aged 18-70, selected by convenience sampling according to Wacholder's criteria¹⁶⁻¹⁸, once the medical record database was complete.

The inclusion criteria were: patients aged 18-70 hospitalised in 2018 and readmitted within 30 days of discharge. The exclusion criteria were: patients under 18 or over 70 years of age, transferred to another department (ongoing hospitalisation), hospitalised outside of the study period or readmitted after day 30 following discharge, or lacking sufficient data for research purposes.

In this study, the dependent variable was early readmission, i.e. readmission ≤ 30 days from their latest discharge, and the independent variables were: age, sex, healthcare system, origin, marital status, type of job, schooling, admission for hospitalisation, primary diagnosis, treatment upon hospital discharge, polypharmacy, adherence to treatment, number of hospitalisations in the past year, illegal psychoactive substance use, sleep quality upon admission, support network, use of non-psychiatric medicines, alcohol use and tobacco use. An Excel 2016 database was used for data collection, and data analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 22.0.

The univariate analysis was performed using descriptive statistics by determining absolute and relative frequencies for categorical variables; in the case of quantitative variables, measures of central tendency and dispersion were calculated. The bivariate analysis was performed to determine possible associations between categorical variables. Tetrachoric tables were prepared with measurement of odds ratios (ORs) with their respective 95% confidence intervals (95% CIs).

To control for misclassification bias, the inclusion and exclusion criteria were clearly defined. To manage measurement bias, the collection form was applied by three investigators. For memory bias, three investigators read the medical records as corroboration.

Results

The results of this study identified rates of early readmission (mean 4%) and modifiable and non-modifiable risk factors associated with them, which might guide institutional decision-making and decrease this problem.

The study found a male-to-female ratio of one-to-one in the two populations analysed (52.4% women and 47.5% men), with ages ranging from 18-70 years (mean 36.6 ± 23.33 years for the MHU in Tunja and 38.9 ± 14.8 years for the MHU in Bogotá). The mean age of the women was 45 ± 15.3 years (cases, 43.8 ± 13.5 ; controls, 40.3 ± 15.9). The mean age of the men was 36.5 ± 12.7 years (cases, 34.3 ± 15.0 ; controls, 35.8 ± 14.8).

In the course of the year, they were hospitalised 1.5 ± 0.7 times in the city of Tunja and 1.2 ± 0.58 times in Bogotá; by sex, on average, women were hospitalised 2.44 times and men were hospitalised 2.33 times during the year. Mean duration of stay per hospitalisation was 23 ± 17.19 days on the two MHUs. Women averaged 27 days; men averaged 23 days. All of this changed upon readmission, with an overall average of 30.5 days (27 days for women versus 20.5 days for men).

With regard to origin, marital status, healthcare system and schooling, similar behaviour was seen in the two populations; however, it should be noted that on the MHU in the city of Bogotá most patients had no occupation at the time of readmission, whereas in the city of Tunja most patients engaged in

Table 1 – Absolute frequencies of sociodemographic characteristics.

Variable	Bogotá (%)	Tunja (%)	Total (%)
Sex			
Men	50.3	44.8	47.5
Women	49.7	55.2	52.4
Healthcare system			
Subsidised	28.2	55.2	41.7
Contribution-based	71.8	13.8	42.8
Origin			
Rural	35.6	55.2	45.4
Urban	64.4	44.7	54.5
Marital status			
Single	50.3	48.3	49.3
Married	20.9	20.7	20.7
Widowed	1.7	6.9	4.3
Separated	12.4	0	6.2
Cohabiting	14.7	24.1	19.3
Occupation			
Independent	9.6	62.1	35.8
Formal	20.9	3.4	12.1
Unemployed	69.8	34.5	52.1
Schooling			
Illiterate	6.2	0	3.1
Primary	23.2	37.9	30.5
Secondary	33.9	58.6	46.2
Technical or vocational	9.6	3.4	6.5
University	24.3	0	12.2
Graduate	2.8	0	1.4

some sort of independent work. Table 1 compiles the general sociodemographic characteristics of the MHUs.

On the two MHUs, the diagnoses encountered were: depression (15.5%), bipolar disorder (33.1%) and schizophrenia (37.3%). In Bogotá the most prevalent diagnosis was depression (31.1%), and in Tunja it was schizophrenia (44.8%). Both units exhibited a low prevalence of diagnoses such as eating disorders (0.85%), neurocognitive disorders (0.85%), personality disorders (0.65%) and anxiety disorders (0.3%).

Regarding the variable of type of admission to the MHU in general, 78.5% of patients were admitted to the accident and emergency department and 21.4% were admitted from an outpatient clinic. A higher prevalence was found in the Bogotá unit (88.1% of emergency admissions) than on the Tunja unit (69%).

Both hospital units showed predominant use of atypical antipsychotic drugs (75.3% of patients) to treat underlying disease. Concerning adherence to treatment, 79% did not adhere to treatment instructions at the time of admission (Fig. 1).

Analysis of polypharmacy was dichotomised as follows: 1–2 versus ≥ 3 prescription medicines upon discharge. The former group included 50.1%, and the latter group included 49.6%. Regarding use of psychoactive substances, alcohol and tobacco, both hospital units showed a high prevalence. Of the patients analysed, 81.2% had a history of psychoactive substance or active psychoactive substance (PAS) use, 69.1% drank alcohol and 77.3% used or had used tobacco. Another predominant finding was a poor sleep pattern upon readmission (88.1% of patients studied on both MHUs) (Table 2).

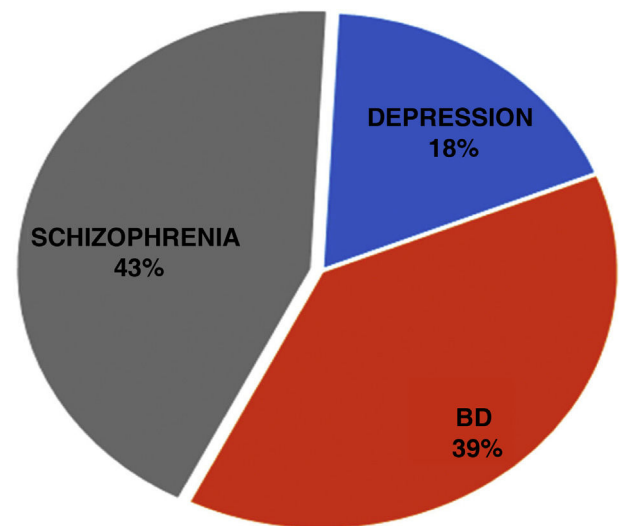


Figure 1 – Prevalence of the main diseases on mental health units. BD: Bipolar disorder.

Data analysis with tests of odds ratios yielded a significant likelihood of hospital readmission in patients with poor adherence to treatment (OR=3.125; 95% CI 1.765–5.34), i.e. more than three times that of those who did show adherence to treatment. Alcohol abuse accounted for a likelihood of readmission 15 times higher than that of those who did not drink alcohol (OR = 15.7; 95% CI 1.34–15.12). Patients on typical

Table 2 – Clinical variables.

Variable	Bogotá (%)	Tunja (%)	Total (%)
<i>Admission</i>			
Outpatient	11.9	31	21.4
Accident and emergency department	88.1	69	78.5
<i>Diagnosis</i>			
Depression	31.1	0	15.5
Anxiety disorders	0.6	0	0.3
Bipolar affective disorder	22	44.3	33.1
Eating disorders	1.7	0	0.85
Neurocognitive disorders	1.7	0	0.85
Personality disorders	1.1	0	0.65
Schizophrenia	29.9	44.8	37.3
Other psychotic disorders	11.9	10.3	11.1
<i>Drugs</i>			
Typical	5.7	6.2	5.9
Atypical	61.0	89.7	75.3
<i>Adherence to treatment</i>			
Yes	28.2	13.8	21
No	71.8	86.2	79
<i>Use of psychoactive substances</i>			
Yes	20.3	17.2	18.7
No	79.7	82.8	81.2
<i>Alcohol use</i>			
Yes	22.6	37.9	30.2
No	77.4	62.1	69.7
<i>Tobacco use</i>			
Yes	21.3	24.1	22.7
No	78.7	75.9	77.3
<i>Sleep quality</i>			
Poor	83.1	93.1	88.1
Good	16.9	6.9	11.9
<i>Polypharmacy</i>			
1–2 medicines	58.8	41.4	50.1
>2 medicines	40.7	58.6	49.6
<i>Long-acting medication</i>			
Yes	1.1	31.8	16.5
No	98.9	68.2	83.5

Table 3 – Association of variables and statistical significance.

Variable	Tunja		Bogotá	
	OR	95% CI	OR	95% CI
Sex (men/women)	1.244	0.280–5.529	1.3	0.168–1.626
Non-adherence to treatment	3.125	1.765–5.534	2.0	0.304–3.4
Days of hospitalisation (<15 days versus ≥15 days)	4.444	0.740–26.678	1.1	0.281–3.93
Treatment upon discharge (1–2 versus ≥3 medicines)	0.545	0.121–2.461	0.350	0.112–1.092
Psychoactive drugs (yes/no)	3.385	0.328–34.919	2.6	0.36–2.225
Alcohol abuse (yes/no)	15.714	1.634–151.125	8.2	0.155–1.153
Antipsychotics (typical versus atypical)	2.889	1.703–4.9	1.5	0.113–8.479
Long-acting medication (yes/no)	0.44	0.116–1.1701	0.08	0.005–1.365

antipsychotic drugs had a 2.8 times higher likelihood of early readmission than patients treated with atypical antipsychotic drugs (OR = 2.88; 95% CI 1.7–4.9) (Table 3).

Analysis of variables did not demonstrate any statistically significant differences, but it did reflect a likelihood of the event studied occurring and also enabled clinicians to back their decision-making, as in the case of those with

hospitalisations lasting less than 15 days with a 4.4 times higher likelihood of readmission (OR = 4.4; 95% CI 0.7–26.6). Similarly, for prescription upon discharge, it could be determined that fewer than three medicines represented a 0.5 times lower likelihood of readmission to the MHU (OR = 0.5; 95% CI 0.121–2.461). PAS use increased the likelihood of readmission by 3.3 times (OR = 3.3; 95% CI 0.32–34.9). Men had a risk of

early readmission scarcely 1.2 times higher than women did (OR = 1.2; 95% CI 0.280–5.529).

Discussion

Difficulties in stabilisation of chronically ill patients in psychiatry leading to a recurring need for treatment on an MHU are seen around the world and have been the subject of many research studies^{1,2,6,19}. Latin America is no stranger to this problem, where some conflicts in the provision of outpatient services, including medication supply and specialist follow-up, increase the odds of readmission^{5,7,8}.

This problem was characterised on two MHUs in two cities in Colombia, one of which was Bogotá, the capital of Colombia, where the population is primarily urban and has all the experiences particular to large cities, while Tunja is a medium-sized city and mostly serves a rural population.

Other differences to highlight between these two populations are the healthcare system, since in Tunja healthcare is largely subsidised despite self-designation as independent workers, and level of education, since in Bogotá patients were distinguished by having up to a graduate level of education in some cases, whereas in Tunja basic education was the most common level of education in the sample.

These differences, however, did not reflect changes in factors that might be associated with early readmission, given that despite said differences, lack of adherence to treatment and alcohol use — things only the patient can modify — were found in both populations and were statistically associated with higher rates of rehospitalisation. Use of long-acting medication appeared to be the solution for patients who had limited disease awareness and trouble with adherence to oral treatment²⁰. In this way this study was comparable to similar studies in developed countries, such as a 2018 study by Moore that reported social abandonment and lack of adherence to treatment as risk factors for early readmission, and a 2017 study by Sfetcu which, following a systematic review of the literature, found time per hospitalisation and poor support network to be risk factors. However, we found no statistical significance for other factors, such as PAS use, a history of other early readmissions and low socioeconomic status, even if those authors did^{2,6}.

When we studied medicines for organic diseases (i.e. diseases without a psychiatric component), such as diabetes, dyslipidaemia and hypertension, our data showed no link to early readmission. By contrast, in Shamer's case-control study, exposure to pravastatin had an OR = 13.1. However, debate persists as to whether the true association is between cardiovascular disease and mental illness, primarily anxiety³.

Other variables that in our study had no statistical significance in the strict sense of the word, but did represent a higher likelihood of readmission and did guide professionals' clinical decision-making, were psychoactive substance use, hospitalisations lasting less than 15 days, hospital discharge with more than three medicines and a preference for typical versus atypical antipsychotic drugs. Two retrospective cohorts of 4,000 and 7,000 patients yielded similar findings, with which it was concluded that these factors, in addition to being single and

being of the median age, were significantly associated with early readmission. By contrast, PAS use in a study by Vijayaraghavan increased the risk of readmission by 1.5 times, while a study by Moore found no statistical significance, as in our sample^{2,10,21,22}.

Compared with global references 2, 3, which reported prevalences of 7%–30%, more specifically 10%–14% in the United States in 2017³, our rates of readmission were lower (close to 4%); however, this might have been influenced by the fact that most of our patients had been referred from different general emergency departments, where readmissions could be occurring and the time criterion could be lost at the time the patients arrived on the MHUs. Another determinant to take into account was the population in social abandonment, which will not regularly be admitted to health institutions until governmental mechanisms create channels for their care; this, too, would result in losing the criterion of time of early rehospitalisation, despite these being patients with uncontrolled disease.

Global reports have pointed to schizophrenia as the disease with the highest prevalence of rehospitalisations. Our samples were consistent with this, unlike other Latin American and Colombian reports^{5,10}. In 2017, Moore found that BD is a significant risk factor for schizophrenia (OR = 1.2). Others have reported that BD has a better prognosis if treatment needs are suitably managed; hence, developing countries tend towards lower numbers of rehospitalisations versus schizophrenia^{2,6,10,20}. Our finding that patients with psychotic disorders had the most early readmissions may have been because these patients seek care for psychotic symptoms immediately, whereas patients with hypomanic or even manic symptoms seek care after a decline in their functioning, which may not occur immediately^{4,15}.

We demonstrated that patients with mental illness without stable control of their condition are at higher risk of being victims of violence, dying by suicide or starting or resuming substance use^{7,8,23}. These are sufficient reasons not to hold back on efforts intended to decrease rates of rehospitalisation through outpatient mechanisms such as day hospitals, outpatient clinics, long-acting medication and even home visits for the most vulnerable patients²⁰.

Conclusions

This study demonstrated a better prognosis versus the likelihood of early readmission in patients with atypical antipsychotic drugs, adherence to treatment and management of alcohol consumption. Duration of hospitalisation, numbers of prescription medicines upon discharge and long-acting medication had less statistical power as protective factors against early readmission. Despite this, they can be presented as favourable practices that improve the likelihood of stabilising patients with mental illness.

The landscape of early readmission in psychiatry will continue to represent a challenge for healthcare groups. Our study offers guidance for some decision-making with respect to treatment. Even so, larger homogeneous samples with longitudinal cohort follow-up are still needed to improve knowledge on this topic.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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