IJEPH
Interdisciplinary Journal of Epidemiology & Public Health

Investigación Original

Frequency and determinants of the re-entry in patients with serious mental disorder

Frecuencia y determinantes de reingreso hospitalario en pacientes con trastorno mental grave

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Received: 17 August 2018
Accepted: 28 November 2018
Published: 15 February 2019

Keywords: Hospital readmission, adherence, hospitalization, severe mental disorder, schizophrenia, depressive disorder, bipolar affective disorder

Palabras clave: Reingreso hospitalario, adherencia, hospitalización, trastorno mental grave, esquizofrenia, trastorno depresivo, trastorno afectivo bipolar

Citation: Campo ANM, Cardona MLA, López PJC, Pacheco R. Frequency and determinants of the re-entry in patients with serious mental disorder. IJEPH. 2019; 2(1): e-016. doi: 10.18041/2665-427X/ijeph.3.5499.

Abstract

Introduction: It is estimated that at least 50% of patients who are regular users of psychiatric hospitalization services have been re-hospitalized during the first year of hospital discharge. To reduce the impact derived from the attention in health events, the SGGC of Colombia recommends that health institutions optimize care resources, evaluate and improve the quality of care in the population that requires hospitalization.

Objective: To identify the determinants related to hospital readmission in patients with a diagnosis compatible with Serious Mental Disorder in a specialized IPS of Cali - Colombia 2017.

Methods: A case-control study was conducted in an IPS specialized in Mental health in the city of Cali, 105 cases and 315 controls were included. For a sample of 420 patients. A bivariate analysis and multivariate analysis were performed. All calculations and statistical tests were performed at a 95% confidence level in the Stata 12 statistical program.

Results: 14.2% of the patients presented at least one reentry. Bipolar affective disorder occurred more frequently in readmissions with 41%, but did not present a statistically significant association with an adjusted OR of 0.94 (CI 95%: 0.53-1.67. The final model showed statistical significance in adherence to treatment as a protective factor to prevent hospital readmission in patients with TMG with an adjusted OR of 0.35 (CI 95%: 0.21-0.58).

Conclusions: The total patients, contributed with 153 hospitalizations (20.7%). For this reason, it is important to follow up the event to establish the causes of re-entry and establish actions that allow reducing their frequency.

Resumen

Introducción: Se estima que al menos el 50% de los pacientes que son usuarios habituales de los servicios de hospitalización psiquiátrica se han re-hospitalizado durante el primer año del alta hospitalaria. Para reducir el impacto derivado de la atención en eventos de salud, el SGGC de Colombia, recomienda a las instituciones de salud optimizar los recursos de atención, evaluar y mejorar la calidad de la atención en la población que requiera hospitalización.

Objetivo: Identificar los determinantes relacionados con el reingreso hospitalario en pacientes con diagnóstico compatible con trastorno mental grave en una IPS especializada de Cali - Colombia 2017.

Métodos: Se realizó un estudio de casos y controles en una IPS especializada en salud Mental de la ciudad de Cali, se incluyeron 105 casos y 315 controles. Para una muestra de 420 pacientes. se realizó un análisis bivariado y análisis multivariado.

Resultados: El 14.2% de los pacientes presentaron al menos un reingreso. El trastorno afectivo bipolar se presentó con mayor frecuencia en los reingresos con un 41%, pero no presentó asociación estadísticamente significativa con un OR ajustado: 0.94 (IC 95%: 0.53–1.67). El modelo final arrojó significancia estadística en la adherencia al tratamiento como un factor protector para prevenir el reingreso hospitalario en pacientes con TMG, OR ajustado: 0.35 (IC 95%: 0.21–0.58).

Conclusión: El total de pacientes, contribuyeron con 153 hospitalizaciones (20.7%). Por esta razón es importante hacer seguimiento al evento para establecer las causas de l reingreso y establecer las acciones para reducir la frecuencia.

Key contribution of the study

Objective:	Identify the determinants related to hospital readmission in patients with a diagnosis compatible with severe mental disorder in a specialized IPS
Study design:	Case control
Source of information:	Clinical history of patients admitted to hospital for severe mental disorder, with retrospective information.
Population/sample	Information from patient records was analyzed: 105 cases and 315 controls for a sample size of 420 records. All rehospitalized patients were included. Controls were selected by simple random sampling.
Statistical analysis	A bivariate and multivariate analysis was performed. Odds ratio (OR) was estimated. A multivariate analysis was performed by means of a binomial logistic regression.
Principle findings	The final model showed statistical significance in adherence to treatment as a protective factor to prevent hospital readmission in patients with severe mental disorder (adjusted OR: 0.35, CI 0.21–0.58, p: 0.000). Bipolar affective disorder was the predominant diagnosis (41.9%) of readmissions. Patients with depressive disorder have a lower risk of readmission (OR: 0.41) and patients who were adherent to treatment with (OR: 0.29) at discharge

ISSN: 2665-427X

Introduction

The concept of severe mental disorder (SMD) arises, in the field of community mental health care. It tries to transcend the limited perspective of clinical diagnosis as the basis for organizing health care. This term includes all long-term mental disorders that lead to the presence of disability and social dysfunction as a consequence of the symptoms of the disease (1). Mental health care is prioritized in the five SIDDD dimensions: Safety towards oneself and others; social and family support; diagnosis referred to psychotic disorders (excluding organic) and some personality disorders; duration of disease and treatment (considering a time greater than two years); presence of disability (referring to a moderate to severe impairment of work, social and family functioning) (2).

In Colombia, about 40.1% of the adult population has had at least one mental disorder, and about 15.2% of patients have been hospitalized for an acute event of SMD (3). In response to this situation, the Colombian Ministry of Health has established public health policies aimed at the prevention and care of the mental health of the population, as an integrated model within the framework of primary health care: among them is the Ten-Year Public Health Plan 2012-2021; that prioritizes social coexistence and mental health with the aim of reducing the impact of the global burden of disease, which is estimated for mental illnesses in 33% of the years lived with disability (4-6).

The complexity of managing SMD and the deficiency in the coverage of specialized services is compounded by the economic impact derived from the treatment (7). In the United States, it reached 148 billion dollars annually, while indirect costs in developed countries are up to six times higher compared to those reported in developing countries (8). To reduce the impact derived from care in mental health events, the Colombian Health Quality Management Guarantee System recommended that health institutions optimize care resources, evaluate and improve the quality of care in the population requiring hospitalization (9,10).

One of the main indicators of the quality of care in psychiatric patients is the early rehospitalization known as "revolving door patients", defined as the reinstitutionalization of a patient, for the same clinical condition, in the following three months after discharge hospitable. Readmission in chronic psychiatric patients can reach 66% (11-13). It is estimated that at least 50% of patients who are regular users of inpatient psychiatric services have been re-hospitalized during the first year after hospital discharge. Among the main determinants of early re-hospitalization, those related to the onset and course of the disease, the characteristics of the psychopathological picture, treatment, social support and life experiences are reported (14,15).

Despite the recommendation of the Ministry of Health for specialized mental health institutions to evaluate the quality of health care, it is therefore important to know the frequency and determinants of mental health re-hospitalization. The objective of this research was to determine the frequency and the determinants of hospital readmission in patients with a diagnosis compatible with SMD treated at an IPS specialized in mental health in Santiago de Cali.

Methods

An analytical observational study of cases and controls was carried out, with retrospective data collection, in patients with a diagnosis compatible with severe mental disorder discharged from a specialized Health Provider Institution in Cali, Colombia. A review of the IPS information system database of records dated between January 1 and December 31, 2017 was carried out. All records of adult patients of both sexes, with SMD, classified according to the ICD-10 codes, who were hospitalized with a diagnosis of severe mental illness, were included. A case was defined as any registry of patients who were re-hospitalized for a period of less than three months for the same cause of a previous hospitalization in a period of three months after discharge, and as a control, any registry of patients who during the following three months after discharge, he was not re-hospitalized for the same cause.

Sample size and sampling Information from all patient records that met the selection criteria, 105 cases and 315 controls, was analyzed for a sample size of 420 records. As all re-hospitalized patients were included, the sampling strategy in the cases was not specified. With respect to the controls, a simple random sampling was carried out to select them (Figure 1). To determine the power of the number of records included in the study, the size and power of the sample was verified through the Openepi statistical package available at https://www.openepi.com/SampleSize/SSCC.htm, taking into account a reliability of 95%, a power of 80%, taking three controls for each case, with a hypothetical proportion of exposure in the controls of 40% for the variable readmission and in the cases of 60%, and an OR of 2, for a suggested sample size of 88 cases and 264 controls.

Study area

It was carried out in a private second-level health service provider Institution (IPS); located in the city of Santiago de Cali; provider of mental health services in the insured population and the general population in ambulatory and hospital mode; Headquartered in the city of Cali, it has psychology, psychiatry, social work and occupational therapy services; in the municipalities of Buga and Palmira with psychology and psychiatry services, it has the qualification criteria of the SSPM. It currently has nine psychiatrists and four expert general practitioners, trained in the management of people with mental disorders. The hospitalization area has the provision of 17 beds in the women's ward and 13 beds in the men's ward and 12 beds in the mixed ward, the day hospital service and the psychosocial rehabilitation center with programs attached to the IPS; with the aim of providing people with a comprehensive service provision.

Ethical considerations

This research was regulated by national regulations according to Resolution 8430 of 1993 of the Ministry of Health of Colombia. This research was approved by the ethics committee of the Universidad Libre as a research with minimal risk according to Act No. 02 of April 30, 2018.

Source of information

All social, demographic and clinical information was obtained from the medical records of the patients admitted to the study,

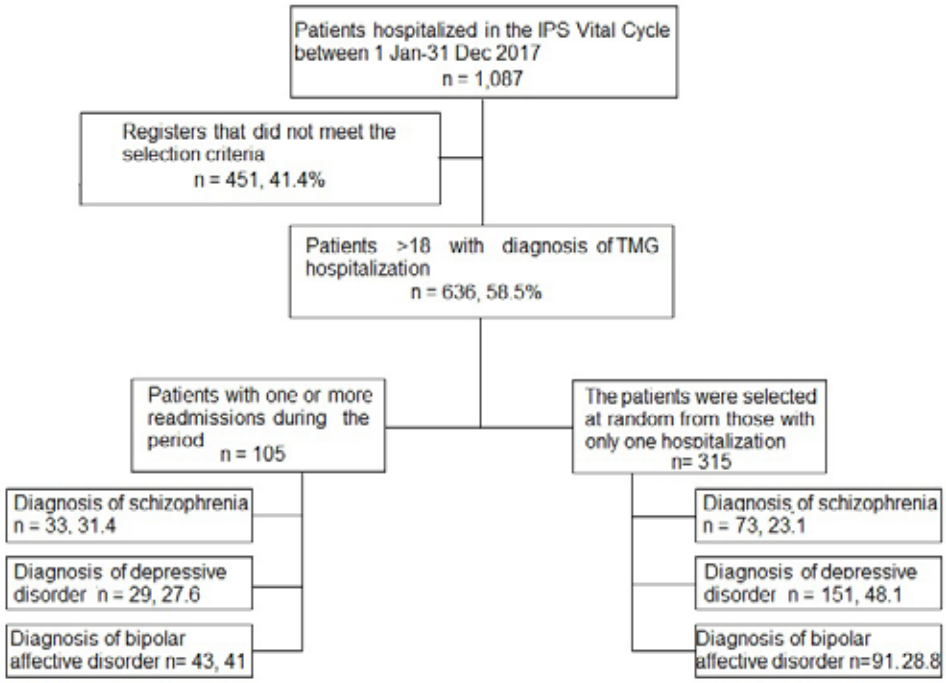

Figure 1. Diagram showing the selection of patients >18 years old with serious mental disorders. IPS Vital Cycle.

which was consigned in an electronic database (Excel® Windows 2010) built for the study. All the information on the exposure variables was collected, without the researchers knowing the case or control classification of the records. To measure the adherence variable, the data described by the doctor in the medical history was taken, as well as the consumption of SPA, in which all the substances referred by the patients at the time of the consultation were included. To protect the identity of the participants, the name and identification of the patients was masked.

Statistical analysis

The information was analyzed in the statistical software Stata 14.0® (Stata Corp, 2014, College Station, TX, USA). The description of the characteristics of the study population was carried out through descriptive statistics. The numerical variables were summarized using the mean or median as measures of central tendency and the standard deviation or interquartile ranges as measures of dispersion, as appropriate. Normality was contrasted through the Shapiro Wilk statistical test, assuming as a null hypothesis that it comes from a sample with a parametric distribution and as an alternate hypothesis that a non-parametric distribution comes from, in the same way, values of $p \leq$ were assumed as significant. 0.05. The qualitative variables were summarized through proportions and presented in frequency tables. Contingency tables were used to explore the possible associations between the exposure variables and the outcome variable "to have or not readmission to hospital" and the strength of association was measured through odds ratio (OR), with their respective 95 confidence intervals.

The strength of this association was estimated through the odds ratio (OR) with its respective confidence interval. For the comparison of categorical variables between cases and controls, the Chi square statistical test or Fisher's test was used and for qualitative variables, the Student's t-test or Mann-Whitney's U test, according to normality criteria. Subsequently, a multivariate analysis was performed using a binomial logistic regression to adjust for possible confounders and determine the variables that were independently associated with having or not having a hospital readmission. In the construction of the models, those variables that in the bivariate analysis reported p values less than or equal to 0.20 were included. The model that involved the least number of variables was selected with the likelihood ratio statistical test.

Results

Of the 1,087 hospital admissions reported, 249 repeated records were discarded and 99 that only had one day of admission, therefore they did not correspond to hospitalizations, thus leaving a total of 739 records, of which 636 corresponded to hospitalizations by SMD in patients over 18 years of age, from these, all the records that met the criteria to be classified as cases were selected in total 105. Of the 531 records that met the criteria to be classified as controls, 315 records were randomly selected. Of the total population hospitalized at the institution during the study period, 14.2% had at least one readmission and only two patients were readmitted on four occasions during the three months following discharge for the same cause.

Readmissions during the study period occurred from the beginning of the year. In all the months there was at least one case for each diagnosis, on average 12.7 cases; January being the month with the lowest number with 3 (2.0%) cases and the months of July, September and October with the highest number on average 16 cases (11.1%), regarding admission diagnoses: 33 (31.4) of the patients were readmitted for Dx of schizophrenia, 29 (27.6) for depressive disorder and 43 (41.0%) for bipolar affective disorder (Figure 2). With respect to demographic characteristics, age presented a median for cases of 37 and for controls of 47; 50% of the study population was over 44 years old, 58% belonged to the

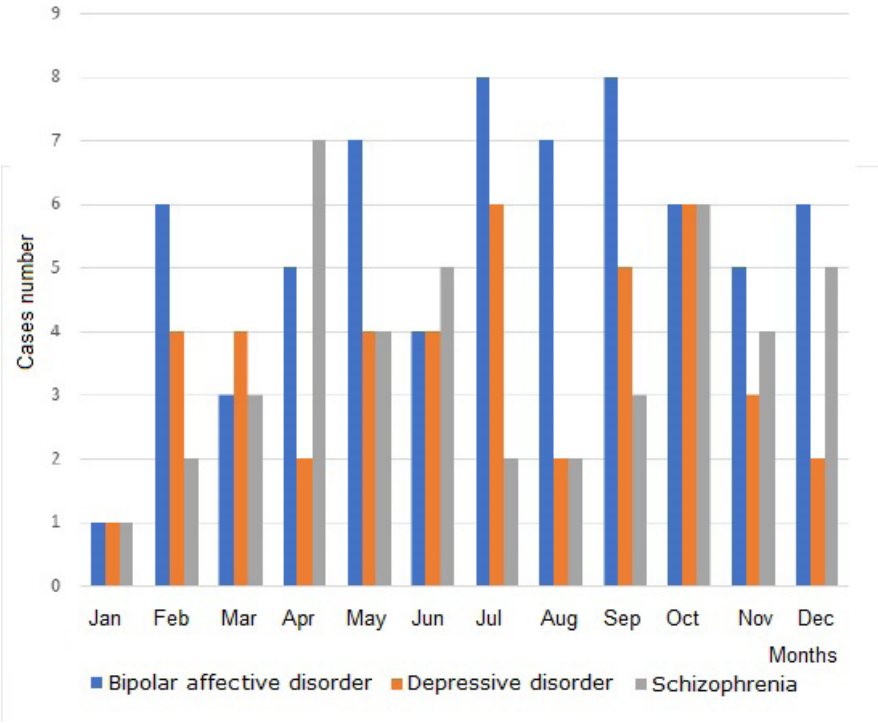

Figure 2. Cases of readmission per month at the Vital Cycle IPS for principle diagnoses. 2017.

female sex; single marital status was the most frequent in 31% of patients; For schooling in a higher proportion, 52% had secondary schooling, in occupation 60% were active at work; with regard to residence, the urban area predominated with 90%; in economic dependence, 50% depended economically on their relatives and 86% reported having support from a caregiver (Table 1).

Regarding the clinical characteristics, the diagnoses were distributed as follows; 25% were admitted for schizophrenia, 42% for depressive disorder, and 31% for bipolar affective disorder; with respect to the presence of comorbidities, 61% did not suffer from them; Regarding the consumption of psychoactive substances, it was found more frequently that 81% did not consume them; regarding the follow-up after hospitalization, 95%) if they had it; Regarding adherence to treatment after discharge, 70% were adherents; for the timely delivery of the medication, 91% were delivered in a timely manner; Regarding the total number of readmissions during the study period, it was found that 62% had 1 readmission, 30% had 2 readmissions, 3% had 3 readmissions and 3% had 4 readmissions (Table 1).

It was found that none of the socioeconomic variables presented an association. Of the clinical variables, four were found: diagnosis of depressive disorder was found to protect against readmission (OR: 0.41) and for the diagnosis of bipolar affective disorder a higher risk of readmission was found (OR: 1.8). Regarding the consumption of SPA, an OR of 2.0 was obtained, finding that patients with this condition are more likely to be readmitted; and finally, for pharmacological adherence, an OR of 0.28 was obtained, being a protective factor to avoid readmission (Table 2). The multivariate logistic regression analysis, in which the dependent variable was hospital readmission; No statistically significant association was observed with the following variables: bipolar affective disorder, depressive disorder and SPA use (Table 3). The final model yielded as an independent and statistically significant variable, adherence to treatment as a protective factor to prevent hospital readmission in patients with SMD with an adjusted OR of 0.35.

Discussion

The present investigation evaluated the frequency and determinants of hospital readmission in patients diagnosed with the mental health disorder in a specialized mental health center in the city of Cali, during the year 2017. It was found that a total of 105 patients presented at least one early readmission to the IPS during the study period, this figure corresponds to 14.2% of the total readmissions to the institution, similar to what was found in the Risaralda Mental Hospital that 320 (13.8%) patients had at least one early readmission during the years 2011 to 2013 (16); In Barcelona (Spain) they found at 30 days of discharge the percentage of readmissions was 14.7% (11,17); In Europe, the readmission percentage was higher, readmissions for mental disorders were found in 26.5% in the study population (18). This difference may correspond to the type of population studied and characteristics studied.

In our study, bipolar affective disorder was the predominant diagnosis (41.9%) of readmissions, similar to what was found in Antioquia where 46.8% of readmissions were reported with this diagnosis (19). Regarding adherence to treatment, it was found that 70% of the patients were adherents, a finding that is related to the Antioquia study in which 72.5% of the studied population was adherent (19). Three of the clinical variables included in the study gave an association. Patients with depressive disorder have a lower risk of readmission, OR: 0.41, as were patients who were adherent to treatment with (OR: 0.29) at discharge (Table 3). Regarding the consumption of SPA, only 27.6% of the patients who were readmitted consumed them. When comparing our results

Table 1. Clinical and demographic characteristics of the study population.

Characteristic	Description	Summary	
		n	%
Age (years)	18-44	210	50.0
	≤45	210	50.0
Gender	Man	183	43.5
	Woman	237	56.4
Marital status	Single	130	30.9
	Married	123	29.2
	Separated	95	22.6
	Living with partner	60	14.2
	Widow	12	2.8
Level of schooling	None	7	1.6
	Primary	102	24.2
	Secondary	220	52.3
	Technical	64	15.2
	University	27	6.4
Occupation	Works	254	60.4
	Does not work	166	39.5
Type of home	Urban	381	90.7
	Rural	9	9.2
Economically dependent	Yes	214	50.9
	No	206	49.0
On whom is the economic dependence	Family	209	49.7
	Own resources	206	49.0
	Other people	5	1.1
Carer present	Yes	364	86.6
	No	56	13.3
Relationship to carer	Wife/husband	131	36.0
	Father	104	28.5
	Child	71	19.5
	Brother/sister	46	4.6
	Other family	9	3.2
Schizophrenia diagnosis	Yes	314	25.2
	No	106	74.7
Diagnosis of depressive disorder	Yes	180	42.8
	No	240	57.1
Diagnosis of bipolar affective disorder	Yes	286	68.1
	No	134	31.9
Presence of comorbidities	Yes	162	38.5
	No	258	61.4
SPA consumption	Yes	79	18.8
	No	341	81.1
Number of readmissions	1	66	62.8
	2	34	32.3
	3	3	2.8
	4	2	1.9
Walk-in controls	Yes	402	95.7
	No	18	4.2
Treatment adherence	Yes	296	70.4
	No	124	29.5
Opportune delivery of medication	Yes	383	8.8
	No	37	91.1

with other studies on factors associated with the readmission of psychiatric patients, a higher percentage of psychoactive substance use is found with 80.3% of the cases having at least one readmission (16).

From the sociodemographic factors, it was possible to determine that the urban area (90.7%) predominated as the origin of the patients, this result was similar to that reported in the study carried out in Risaralda where the urban population corresponded to 95% (16), although the origin It is not related to the reports of distribution of mental pathology in our country; according to the 2015 National Survey of Mental Health, the lifetime prevalence of any mental disorder in adults reaches 10% in urban areas and 6.1% in rural areas (3). The low representation of the rural population in this study is related to the type of health regime that the institution serves since it only provides services to EAPB of the contributory regime. Regarding the association of the variables, sociodemographic and personal, with the readmission of psychiatric patients, no statistically significant association was found. Although sex did not present statistical significance, 58% of the patients who were readmitted were female, a situation that is consistent with studies carried out in the country. In a study carried out at the Nuestra Señora de la Paz Clinic, Bogotá, where most of the readmissions 59.2% corresponded to women (20), while the study carried out at the Risaralda University Mental Hospital found that 60% of the readmissions belonged to the male sex (16).

People with severe mental disorder (SMD) are characterized by presenting a series of difficulties that increase their fragility in coping with the incidents of daily life and are associated with the need for continuous help in order to achieve the highest level of personal autonomy possible. Thus, many people with SMD have difficulties to independently cover their housing needs and maintain a decent and adequate home for their needs and desires (21). In Colombia, following Law 100, there has been a gradual process of "dehospitalization" (hospital discharge of people with mental disorders). The reduction in hospital stays has not, however, meant a paradigm shift in the care of people with mental disorders, as hospitalization are still the main axis of their care,

Table 2. Evaluation of risk factors. Bivariate analysis.

Characteristic	Description	n	Cases	Controls	OR	CI (95%)	p-value
Gender – Masculine – Feminine	Masculino	183	44	139	1,0	0.68 -1.75	0.69
	Femenino	237	61	176			
Schooling	Yes	413	104	309	2,0	0.24-93.75	0.50
	No	7	1	6			
Marital status	Has partner	183	40	143	0.7	0.45-1.18	0.19
	No partner	237	65	172			
Economically dependent	Yes	214	60	154	1.3	0.87-2.23	0.14
	No	206	45	161			
Occupation	Works	254	65	189	1.0	0.67-1.75	0.72
	Does not work	166	40	126			
Presence of carer	Yes	364	92	272	1.1	0.55 - 2.37	0.74
	No	56	13	43			
Schizophrenia	Yes	105	32	73	1.4	0.85-2.43	0.13
	No	315	73	242			
Depressive disorder	Yes	180	29	151	0.4	0.24-0.68	0.003
	No	240	76	164			
Bipolar affective disorder	Yes	135	44	91	1.8	1.09 - 2.87	0.01
	No	285	61	224			
Comorbidities	Yes	162	38	124	0.8	0.53 -1.41	0.56
	No	258	67	191			
SPA consumption	Yes	79	29	50	2.0	1.148- 3.51	0.00
	No	341	76	265			
Walk-in controls	Yes	402	104	298	5.9	0.90 - 250.24	0.05
	No	18	1	17			
Adherence to drug treatment	Yes	296	52	244	0.2	0.17 -0 .46	0.00
	No	124	53	71			
Opportune delivery of medication	Yes	383	91	292	0 .5	0.24 - 1.12	0.05

while the alternatives for community care and rehabilitation are few (22).

It is important to mention that the data for the measurement of adherence and consumption of SPA, in this study was obtained from medical records in clinical history, and an instrument was not used for this purpose due to its retrospective nature, to which the difference in results in other studies can be attributed.

Weaknesses

• Given the retrospective nature of this study and that the information was not collected for research purposes but for health care purposes, some measurements could not be so precise which could lead to information bias, so they were discarded those records in which the information was not complete (23).

• Although most of the patients had outpatient follow-up and timely delivery of medications, it is outside the scope of our study to establish whether the accessibility and timeliness of these consultations were adequate, and the continuity in the delivery of the medication; taking into account the difficulties of our Health System (20).

• Taking into account that the study was carried out in a single institution and that all the patients belonged to the contributory insurance scheme, the data cannot be extrapolated to the general population.

Strengths

• Although the study was conducted in a single institution, a larger sample than recommended for cases and controls was included, since all readmissions were included and three controls were randomly selected for each case to increase the power of the study (24).

• Confusion bias was controlled by performing a logistic regression analysis to define the variables that showed a true association in the occurrence of the event, and selection bias was controlled by clearly defining that readmissions corresponded to patients.

Table 3. Evaluation of possible risk factors. Multivariate analysis.

Characteristic	Description	n	Cases (n)	Controls (n)	OR	CI (95%)	p	Adjusted OR	CI (95%)	p
Bipolar affective disorder	Yes	135	44	91	0.4	0.24 -0.685	0.00	0.9	0.53 -1.67	0.83
	No	285	61	224						
Depressive disorder	Yes	180	29	151	0.4	0.24 -0.685	0.00	0.5	0.31 -1.03	0.06
	No	240	76	164						
SPA consumption	Yes	79	29	50	2.0	1.14 - 3.51	0.00	1.5	0.86 -2.63	0.14
	No	341	76	265						
Treatment adherence	Yes	296	52	244	0.2	0.17 -0.467	0.00	0.3	0.21-0.58	0.00

Conclusions

The total of patients who were readmitted contributed 153 hospitalizations (20.7%) of the total of the 739 hospitalizations presented in 2017 in the Life Cycle IPS. For this reason, it is important to follow up on this event to promptly intervene in patients who present more than one readmission to establish the causes and take actions to reduce their frequency. Hospital readmissions generate an
increase in costs in health systems and increases the negative effects on family support and social support systems that patients have. Hospital readmissions are considered an indicator of quality in psychiatric care and it is also important to take them into account to measure the severity of the disease.

Acknowledgements
To the IPS who accepted the study to be carried out there, and to the patients who indirectly contributed their information to the study, which was the primary input for conducting this research, and to the Masters degree in Epidemiology staff from the Universidad Libre [Free University] for their support during the development of this study.

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