Trends
in Psychiatry and Psychotherapy

Prevalence and trends of mental disorders requiring inpatient care in the city of Porto Alegre: a citywide study including all inpatient admissions due to mental disorders in the public system from 2013-2017

Prevalência e tendências temporais de transtornos mentais necessitando de tratamento de internação na cidade de Porto Alegre: um estudo de toda a cidade incluindo todas as internações por motivo de saúde mental no sistema público de 2013-2017

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Abstract

Objectives: To investigate the 5-year prevalence of patients admitted to public inpatient care units due to a mental disorder, stratifying them by age group and diagnosis, and to assess trends of admissions over this time period in Porto Alegre.
Methods: All admissions to the public mental health care system regulated by the city-owned electronic system Administração Geral dos Hospitais (AGHOS) were included in the analysis. The total population size was obtained by estimations of Fundação de Economia e Estatística (FEE). General information about 5-year prevalence of inpatient admissions, time-series trends e prevalence by age groups and diagnosis were presented.
Results: There were 32,608 admissions over the 5-year period analyzed. The overall prevalence of patients was 1.62% among the total population, 0.01% among children, 1.12% among adolescents, 2.28% among adults and 0.93% among the elderly. The most common diagnosis was drug-related, followed by mood, alcohol-related and psychotic disorders. There was a linear trend showing an increase in the number of admissions from 2013 to the midst of 2014, which dropped in 2015.
Conclusions: Admissions due to mental disorders are relatively common, mainly among adults and related to drug use and mood disorders. Time trends varied slightly over the 5 years. Prevalence rates in real-world settings might be useful for policymakers interested in planning the public mental health system in large Brazilian cities.
Keywords: Mental disorders, prevalence, inpatient care, admissions, public health.

Resumo

Objetivos: Investigar a prevalência de 5 anos de pacientes internados no sistema público de saúde por motivo de saúde mental, estratificando-os por grupo etário e diagnóstico, e avaliar tendências temporais nas admissões nesse período em Porto Alegre.
Métodos: Todas as admissões no sistema público de saúde mental reguladas pelo sistema eletrônico da cidade, denominado Administração Geral dos Hospitais (AGHOS), foram incluídos na análise. A população total foi obtida a partir de estimativas da Fundação de Economia e Estatística (FEE). Informações gerais sobre a prevalência de 5 anos de admissões, tendências das séries temporais e prevalência por grupo etário e por diagnóstico foram apresentadas.
Resultados: Ocorreram 32.608 admissões no período de 5 anos analisado. A prevalência global de pacientes foi de 1,62% na população total, 0,01% em crianças, 1,12% em adolescentes, 2,28% em adultos e 0,93% em idosos. Os diagnósticos mais comuns foram relacionados ao uso de drogas, seguidos de transtornos de humor, relacionados ao álcool e transtornos psicóticos. Houve uma tendência linear mostrando um aumento no número de admissões de 2013 a meados de 2014, que caíram em 2015.
Conclusões: Admissões por transtornos mentais são relativamente comuns, principalmente entre adultos e relacionados ao uso de drogas e transtornos de humor. Tendências lineares variaram levemente nos últimos 5 anos. Estimativas de prevalência no mundo real podem ser úteis para formuladores de políticas interessados em planejar o sistema público de saúde mental em grandes cidades brasileiras.
Descritores: Transtornos mentais, prevalência, cuidados hospitalares, internações, saúde pública.

Introduction

Only a minority of individuals affected by mental disorders around the world have access to treatment.[1] This important treatment gap is even more profound in low- and middle-income countries (LMICs).[2-4] To address this gap, it is essential to incorporate a public health approach in health systems. In LMICs, one of the barriers to building effective mental health systems is the scarcity of credible data that reflect population needs, including of those individuals who would benefit most from specialized mental health care.

From a clinical perspective, the need for psychiatric admission reflects to a great extent the severity of a mental health disorder and also limited functionality. After the first psychiatric admission there is a significant increase in the risk of premature all-cause mortality and a strong increase in the number of deaths, especially by suicide.[5] These findings reinforce the importance of focusing on patients requiring psychiatric inpatient care as a key population that needs attention from a public health perspective. Understanding the demands of the population with the greatest need for care can reveal important information toward preventive efforts.

Data on existing patterns of inpatient service utilization represent a fundamental piece of information to understand current resource utilization at its highest level and can guide public health management towards the best application of resources, planning of services and establishment of attainable goals in mental health,[6] particularly in countries with integrated public health systems, like Brazil. The Brazilian Unified Health System (Sistema Único de Saúde [SUS]) is one of the largest public health programs in the world, and covers about 70% of the population. It complies with the principles of universality, integrality, equity and decentralization, from the primary level of health care to the secondary and tertiary levels. Despite that, no citywide perspectives are available to provide such prevalence rates in Brazilian cities.

The aim of this study was twofold: 1) to investigate the 5-year prevalence of patients admitted to public inpatient health care units in the municipality of Porto Alegre due to a mental disorder, stratified by age group and diagnosis; and 2) to investigate time trends of inpatient admissions over this time period.

Methods

Data about all mental health admissions to any inpatient unit that receives mental disorders (a total of 17 units) through SUS between 2013 to 2017 in the municipality of Porto Alegre were extracted from the city-owned electronic system Administração Geral dos Hospitais (AGHOS), a database covering all hospital admissions in the public health system of Porto Alegre, which represents 70% of residents.[7] The city has about 466 contracted psychiatric beds in 11 institutions (general hospitals and specialized hospitals); the number of beds per institution varies from 10 to 150. Admissions are regulated by two psychiatric emergency services with 14 beds each operating at 200% of their capacity.

To calculate 5-year prevalence estimates, the numerator was the number of patients with at least one admission between 2013 and 2017. Readmissions were excluded using the consolidated information of the system, which considers the patient's name, demographic information and registration records, because our main objective was to calculate the overarching prevalence for the overall time frame. The denominator was the total number of residents (1,478,229 people), extracted from estimates issued by Fundação de Economia e Estatística (FEE),[8] available for the years 2013 to 2016. Estimates were adjusted to reflect only the number of residents who depend solely on the public system for healthcare, i.e., 70% of the residents (1,034,760 people).

We also calculated the rates of the main diagnosis, based on the discharge code, defined according to criteria from the International Classification of Diseases, 10th revision (ICD-10).[9] We created 14 broad categories that encompass 59 ICD-10 codes included in the database (data available as online-only supplementary material). For patients admitted more than once, and for those admitted with more than one diagnosis, one ICD-10 code was randomly selected. For calculating trends over time, we used a time series decomposition analysis that separates time trends from seasonal influences. For these analyses, all first-time admissions and readmissions were used, given the aim to investigate the general trends in admissions over time.

The institutional review boards from Hospital de Clínicas de Porto Alegre and Secretaria da Saúde de Porto Alegre approved the study.

Results

Overall there were 32,608 admissions to public mental health inpatient units in the city over the 5 years analyzed, totaling 16,794 patients admitted at least once (and 15,814 readmissions). The number of admissions per patient ranged from 1 to 44 over this time period (median=1). The overall 5-year prevalence

of patients admitted was 1.62% in the total population, 0.01% in children, 1.12% in adolescents, 2.28% in adults and 0.93% in the elderly.

The prevalence of mental disorders among individuals admitted to a hospital varied according to age (Table 1 and Figures S1 and S2, available as online-only supplementary material). In general, drug-related and mood disorders were the most prevalent disorders in adolescents and adults, mood and alcohol-related disorders in elderly, and mood and autism spectrum disorders in children.

According to time series decomposition analysis, the trends of all admissions over time revealed a slight seasonal variation, with the lowest number of admissions occurring in May and the highest in November (Figure 1). There was also a linear trend showing an increase in the number of admissions from 2013 to the midst of 2014, dropping in 2015, with a monthly mean of admissions of 543.2 (SD=69.34) in the following years.

Discussion

According to our results, over the past 5 years, inpatient admissions due to mental disorders were relatively common in adolescents, adults and in the elderly, but rare in children. A prevalence of 1.62% was found for the total population, with higher rates in adults. The most common diagnoses in the total sample were drug-related disorders, followed by mood, alcohol-related and psychotic disorders, but there were important differences across the age groups. There was a linear trend showing an increase in the number of admissions from 2013 to the midst of 2014, which again dropped in 2015 and subsequent years.

To the best of the authors' knowledge, this is the first study to investigate the prevalence of people with mental disorders admitted to inpatient care units in a large Brazilian city, whereas previous efforts to estimate rates of inpatient utilization were limited to specific hospital settings,[10,11] Brazilian states,[12-14] and age groups.[15,16] Notwithstanding, those previous studies did not investigate the prevalence of first-time hospitalizations in these populations, since they did not exclude rehospitalizations, but rather investigated temporal trends or frequencies of hospital records according to groups of disorders. Moreover, most of those studies used data from the Information Technology Department of the Brazilian Unified Health System (DATASUS), which is limited to estimating current hospitalization rates, as new records are created after 30 days of the previous hospitalization, and it is not possible to discriminate

Table 1 - Estimated prevalence of mental disorder requiring inpatient admission over 5 years, stratified by age group

Disorders*	Children (0-9 years) 125,849			Adolescents (10-19 years) 137,856			Adults (20-59 years) 598,654			Elderly (≥60 years) 172,399			Total 1,034,760		
	n	%	Prevalence	n	%	Prevalence	n	%	Prevalence	n	%	Prevalence	n	%	Prevalence
Autism spectrum	5	29.4	0.00397%	17	1.100	0.01233%	8	0.059	0.00134%	0	0.000	0.00000%	30	0.179	0.00290%
Intellectual disability	2	11.8	0.00159%	48	3.105	0.03482%	151	1.108	0.02522%	6	0.376	0.00348%	207	1.233	0.02000%
Organic syndrome	0	0.0	0.00000%	1	0.065	0.00073%	30	0.220	0.00501%	43	2.693	0.02494%	74	0.441	0.00715%
Conduct	2	11.8	0.00159%	100	6.468	0.07254%	9	0.066	0.00150%	0	0.000	0.00000%	111	0.661	0.01073%
Obsessive-compulsive	0	0.0	0.00000%	0	0.000	0.00000%	10	0.073	0.00167%	1	0.063	0.00058%	11	0.065	0.00106%
Alcohol-related	0	0.0	0.00000%	5	0.323	0.00363%	1,500	11.002	0.25056%	442	27.677	0.25638%	1,947	11.593	0.18816%
Drug-related	1	5.9	0.00079%	612	39.586	0.44394%	5,649	41.433	0.94362%	54	3.381	0.03132%	6,316	37.609	0.61038%
Eating	0	0.0	0.00000%	5	0.323	0.00363%	18	0.132	0.00301%	1	0.063	0.00058%	24	0.143	0.00232%
Personality	0	0.0	0.00000%	23	1.488	0.01668%	68	0.499	0.01136%	2	0.125	0.00116%	93	0.554	0.00899%
Mood	6	35.3	0.00477%	532	34.411	0.38591%	4,037	29.610	0.67435%	706	44.208	0.40952%	5,281	31.446	0.51036%
Dissociative	0	0.0	0.00000%	0	0.000	0.00000%	4	0.029	0.00067%	1	0.063	0.00058%	5	0.030	0.00048%
Anxious/phobic	0	0.0	0.00000%	2	0.129	0.00145%	11	0.081	0.00184%	1	0.063	0.00058%	14	0.083	0.00135%
Psychotic	0	0.0	0.00000%	184	11.902	0.13347%	2,117	15.527	0.00334%	336	21.039	0.19490%	2,637	15.702	0.25484%
Others	1	5.9	0.00079%	14	0.906	0.01016%	20	0.147	0.00334%	4	0.250	0.00232%	39	0.232	0.00377%
Total	17	100	0.01351%	1,546	100	1.12146%	13,634	100	2.27744%	1,597	100	0.92634%	16,794	100	1.62299%

* According to the International Classification of Diseases, 10th revision (ICD-10).
If the patient was admitted due to distinct ICD-10 codes in the 5 years analyzed, only one ICD-10 code was randomly selected.

between new admissions and new records of the same hospitalization that continued (the unit of analysis is the record, not the individual).[13,15] In order to compare the proportion of people affected by mental disorders in the community and estimate access to inpatient care, it is important to investigate evidence from community samples. Only one study using probabilistic sampling was conducted in the city of Porto Alegre in 1991 using a community sample.[17] That study showed that mental disorders affected 42.5% of the sample, with 33.7% of those with a mental disorder utilizing treatment from a mental health professional. The most common diagnoses in that study were phobias (14.1%), followed by depressive states (10.2%), anxiety disorders (9.6%) and alcohol abuse/dependence (9.2%). Drug abuse/dependence was not assessed in that study. If we assume those rates are still valid in the community, we can observe that phobias and anxiety disorders are less likely to require inpatient care, because the number of admissions due to these conditions were very low in our sample; conversely, depressive states, alcohol-

related and psychotic disorders were the leading causes of inpatient admission.

Studies conducted in different Brazilian states have investigated time series and changes in records of psychiatric admissions using DATASUS.[12-14] Two of them found a >50% increase in the number of hospitalizations in the states of Minas Gerais (between 2001 and 2013)[12] and São Paulo (between 2000 and 2015).[14] In São Paulo, hospitalization rates per group of disorders decreased in almost all groups, with the exception of substance-related disorders, where there was a substantial increase (107%, 91% for men and 203% for women in the period).[14] In Minas Gerais, there was a linear trend towards a decrease in the proportional number of hospitalization records due to schizophrenia in the period, with an increasing tendency for mood and substance-related disorders.[12] In both studies, the decrease in the supply of beds was cited as a factor related to the decrease in the number of hospitalization records. Another study, in the state of Rio Grande do Sul (whose capital is Porto Alegre),[13] investigated changes
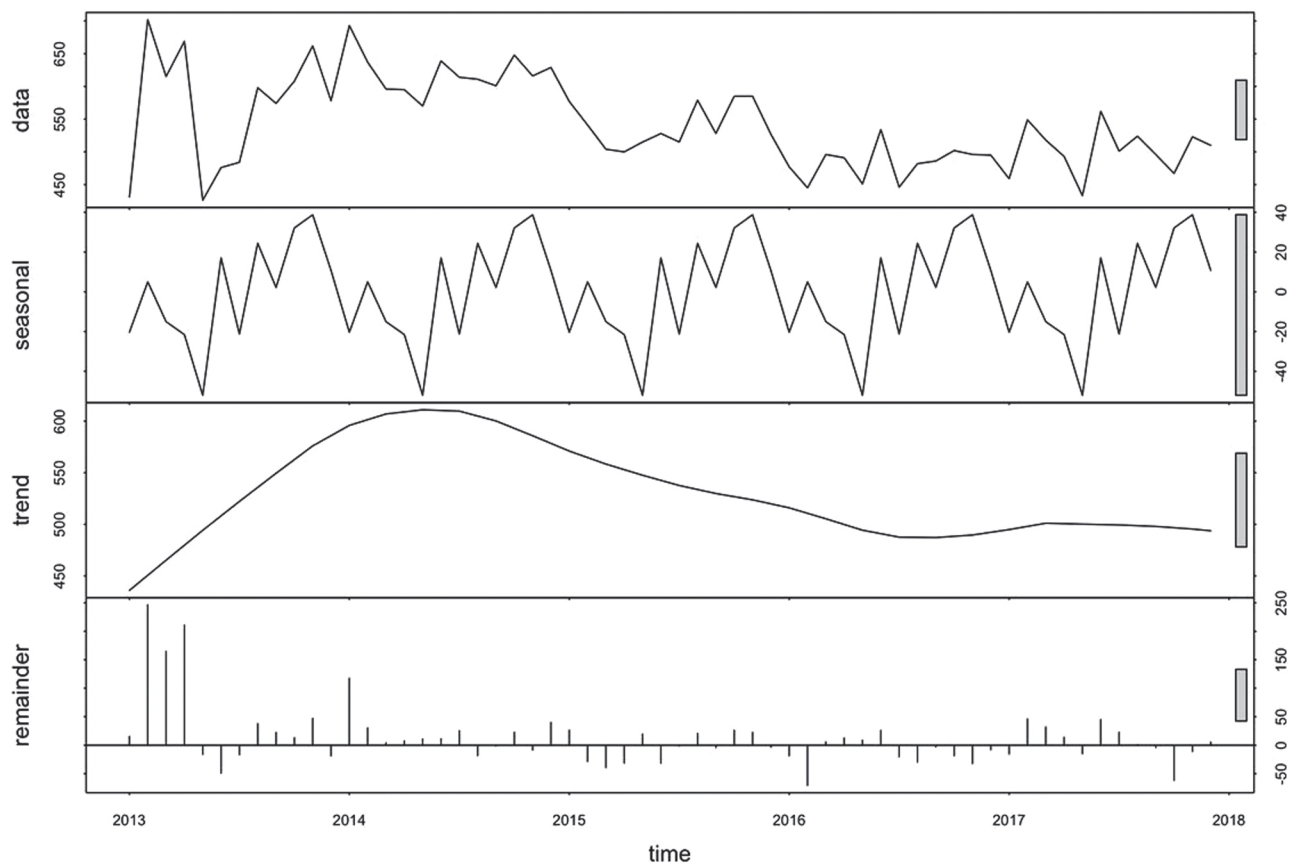

Figure 1 - Time series decomposition analysis for all admissions over the 5 years analyzed (n=32,608)

in hospitalization records in a smaller period (2000 to 2004). There was a small decrease in the number of records in the period (about 5%), with a decrease in the linear trend in the proportion of hospitalizations due to schizophrenia and an increase in mood disorders (with stability for substance-related disorders). A probable explanation for the decrease in the number of hospitalizations and admission records in our study and in the country concerns the closure of psychiatric beds in Brazil.[18] The psychiatric reform in the country has determined the replacement of beds in specialized hospitals with beds in general hospitals, and this process has not been occurring as recommended, resulting in a scenario of bed shortage and underfunding.

No nationally or regionally representative studies of prevalence are currently available; the most recent epidemiological study performed in the country was conducted in the city of São Paulo.[19] That study showed a 12-month prevalence of mental disorders of 30% (20% anxiety, 11% mood, 4.2% impulse control, 3.6% substance/drug), of which 10% were found to be severe. Also, that study showed that only 23.2% of severe disorders receive any mental health treatment, which represents 2.3% of the population of São Paulo (the authors, however, did not differentiate between outpatient and inpatient care). This is important when establishing public policies, and when estimating the demand of specialized mental health support in a city, despite some limitations commented on below.

This study has several strengths. First, to our knowledge, this is the first study to report the prevalence of psychiatric admissions in a citywide database in Brazil, with the possibility of estimating the actual prevalence of cases. Second, we were able to estimate the most common diagnoses in different age ranges, which is very helpful for service planning. However, there are also some limitations that should be considered. First, inpatient care is ultimately dependent on the number of psychiatric beds available, and this might directly impact the number of admitted patients. Second, data are limited to admissions that occurred in the public system, because the private sector is independent, but covers about 30% of the population of the city. Because the number of private beds in the city are estimated to account for half of the total number of beds in the city, our numbers are likely to be underestimated by the non-representation of this segment. Finally, ICD-10 diagnoses were registered based on clinical evaluation only and do not consider comorbid diagnoses. To minimize the effect of biased reporting of ICD-10 codes, we combined several diagnoses into groups of broad diagnostic categories, which are more likely to be consistent.

Evaluation of the prevalence of mental disorders in severely ill patients, such as psychiatric inpatients, is a first step toward a more accurate and systematic management process, where public policies and resource allocation rely on availability and information, directing efforts according to the actual demand of each city.

Disclosure

No conflicts of interest declared concerning the publication of this article.

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