

Psychiatric hospitalizations in the Rio Grande do Sul State (Brazil) from 2000 to 2011

Hospitalizações psiquiátricas no Rio Grande do Sul de 2000 a 2011

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ABSTRACT: *Objective:* To examine the variation in the rates of psychiatric hospitalization and the mean hospital stay time in the public health system in the state of Rio Grande do Sul, in the south of Brazil, from 2000 to 2011. *Methods:* This was an ecological study. Data were collected from DATASUS. The rates were obtained from diagnosis of admissions due to psychoactive substance use and to other causes, stratified by the gender of the patients. The data were analyzed using Poisson regression and Spearman correlation coefficient. *Results:* Increasing hospitalization rates were observed for women with disorders due to substance use ($p < 0.001$) and other causes ($p < 0.001$), and among men with disorders due to the use of alcohol or other drugs ($p < 0.001$). This elevation of the rates remained statistically significant and inversely correlated to the length of hospital stay ($p < 0.001$). *Discussion:* In a period of expansion of the local care networks for mental health, an increase in the occupancy of psychiatric beds in the state was noticed, with shorter length of stay and greater diversity of gender and causes of hospitalization.

Keywords: Hospitalization. Mental Health. Unified Health System. Epidemiology. Health services evaluation. Substance-related disorders.

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RESUMO: *Objetivo:* Examinar a variação das taxas de hospitalização psiquiátrica e o tempo médio de permanência em hospital, no sistema público de saúde no estado do Rio Grande do Sul, de 2000 a 2011. *Métodos:* Foi realizado estudo ecológico, com dados coletados do DATASUS. Foram elaboradas taxas conforme diagnóstico de internações decorrentes do uso de substâncias psicoativas e pelas demais causas, estratificadas por sexo dos pacientes. Os dados foram submetidos a regressão de Poisson e coeficiente de correlação de Spearman. *Resultados:* Observou-se aumento das taxas de hospitalizações de mulheres para transtornos decorrentes do uso de substâncias ($p < 0,001$) e para as demais causas ($p < 0,001$), bem como para transtornos por uso de álcool ou outras drogas entre os homens ($p < 0,001$). Esta elevação das taxas manteve correlação inversa e estatisticamente significativa com o tempo de permanência hospitalar ($p < 0,001$). *Discussão:* Percebeu-se, num período de expansão das redes locais de cuidado em saúde mental, aumento da ocupação dos leitos psiquiátricos no estado, com menor tempo de permanência e maior diversidade de gênero e de causas de hospitalização.

Palavras-chave: Hospitalização. Saúde mental. Sistema Único de Saúde. Epidemiologia. Avaliação de serviços de saúde. Transtornos relacionados ao uso de substâncias.

INTRODUCTION

The reformulation of the care model for mental health in the country has been accompanied, and often crossed, by the national debate about the reduction of available hospital beds, particularly, in the public health network.¹ Approximately 42,000 hospital beds might have been disabled in the last 7 years in Brazil, and the area with the greatest reduction was mental health. In the state of Rio Grande do Sul, in the south of Brazil, the observed decrease was of 10.0% of the total beds, very close to the national variation, with a reduction of 10.5%.

The reduced supply of psychiatric beds is not exclusively a result of funding difficulties and expansion of hospital services in general. The proposed care model suggests avoiding the centrality of the hospital, whether general or specialized, in the sense that therapeutic interventions are not available only in hospital area, even though hospitalizations are expected².

The psychiatric hospitalization still appears in the popular imagination, in the media, and in the debates about the reformulation of the care model as the equipment reserved for the imprisonment of madness. Such image is often relevant and coming from inherited models of the first total institutions, implemented since the middle ages in different nations³⁻⁶. The challenging of segregating practices, which triggered the psychiatric reform and the anti-asylum movement^{4,6,7}, envisioning the care in communities through substitutive services⁸, did not ignore the need for hospitalization of many users of these services^{3,4,9,10}. The movement called for the offer of hospitals beds in general hospitals⁸, closer to each community and integrated to the local care networks^{3,4,7}.

The transition of specialized hospital beds for general hospitals has already been occurring in Rio Grande do Sul over time. Moreover, the local care networks for mental health have aggregated the psychosocial care centers (CAPS) as reference services in each territory, designed

for replacing, as much as possible, the hospital care.¹¹ The text of Law No. 10,216, which redirects the care model for mental health in Brazil, says that hospitalizations will be suggested only when the extra-hospital resources prove insufficient, and with the permanent purpose of social reintegration of the individual in his or her midst, indicating the expectation that the length of stay in the hospital can be minimized. Recent advances in psychopharmacology reinforce this possibility, in the direction of follow-up care initiatives in an extra-hospital environment.

The municipalities of the state of Rio Grande do Sul have responded positively to the Ministry of Health initiatives toward what is intended in the reform of the mental health sector, although heterogeneously when its regions are compared¹². According to the Department of Informatics of the Unified Health System (DATASUS), at the end of 2011, 95 municipalities offered assistance, totaling 160 CAPS already registered.

The establishment or empowerment of the local health networks involve provision of specific actions also in relation to the injuries resulting from the use of alcohol and other drugs, with the possibility of installation of specialized centers, called CAPS AD¹³. The supply of different community services for disorders resulting from the use of substances or not, and the demarcation of specific beds in hospitals for each of these groups of diagnoses that motivate hospitalizations require separate analyses in this scenario.

This study analyzed the variation in the psychiatric hospitalization rates in the public health system and the mean length of hospital stay in the state of Rio Grande do Sul, from 2000 to 2011, according to the gender of the patient and the diagnostic group on admission.

METHOD

An ecological study was carried out, describing hospitalization rates and mean length of stay in hospital beds for mental and behavioral disorders due to the use of alcohol and other psychoactive substances and other causes of mental disorders, in individuals of both genders, with ages equal to or more than 15 years, in the state of Rio Grande do Sul, from 2000 to 2011.

The source of data was the Health Information System (hospital morbidity data from SUS) available in DATASUS, according to the place of residence.

Thus, four dependent variables were constructed:

- hospitalizations for diagnoses of mental and behavioral disorders due to the use of alcohol and other psychoactive substances (ICD10: F10 – F19);
- other causes represented by hospitalizations for diagnoses of organic mental disorders/dementia (ICD10: F00 – F09), schizophrenia, schizotypal and delusional disorders (ICD10: F20 – F29), mood disorders (ICD10: F30 – F39), neurotic and stress related and somatoform disorders (ICD10: F40 – F49), behavioral syndromes related to physiological factors (ICD10: F50 – F59), personality disorders (ICD-10: F60 – F69), intellectual disability (ICD10: F70 – F79), or other mental and behavioral disorders (ICD10: F80 – F99);

- mean period of hospitalization for diagnoses of mental and behavioral disorders due to the use of alcohol and other psychoactive substances;
- mean length of hospitalization for diagnoses of organic mental disorders/dementia, schizophrenia, schizotypal and delusional disorders, mood disorders, neurotic and stress related and somatoform disorders, behavioral syndromes related to physiological factors, personality disorders, intellectual disability, or other mental and behavioral disorders.

The population data, necessary to prepare the admission rates, were also available at the DATASUS website, according to gender.

The rates were calculated using the formula: (total of admissions for group of causes by gender in the year)/(total population by gender in the year) \times 100,000 inhabitants.

With the data extracted from DATASUS, spreadsheets have been prepared in the software Microsoft Excel[®] and later analyzed using the program STATA 11.1.

The gender specificities for the occupation of beds in hospitals and seeking health services justified the stratification according to the variable gender of the patient in this analysis^{14,15}. We analyzed the coefficients according to the gender of the person that was hospitalized and the group of causes of hospitalization using Poisson regression with robust variance¹⁶, with respective confidence intervals and Wald statistical test. To assess the adequacy of the analyzed model, we used χ^2 -test, Goodness-of-fit, determining as an appropriate adjustment by p-value of > 0.05 ^{17,18}. The coefficient of the Poisson regression showed the variation in hospitalization rates and mean periods of hospitalization for both groups of causes, according to gender, over the period. The Spearman correlation coefficient was also calculated for the variations in the hospitalization rates according to the mean length of stay for both groups of causes, according to gender, over the period.

The project was approved by the Research Ethics Committee (REC) at Unisinos, according to the Resolution 135/2012 of December 13, 2012. The authors inform that there are no conflicts of interest to highlight.

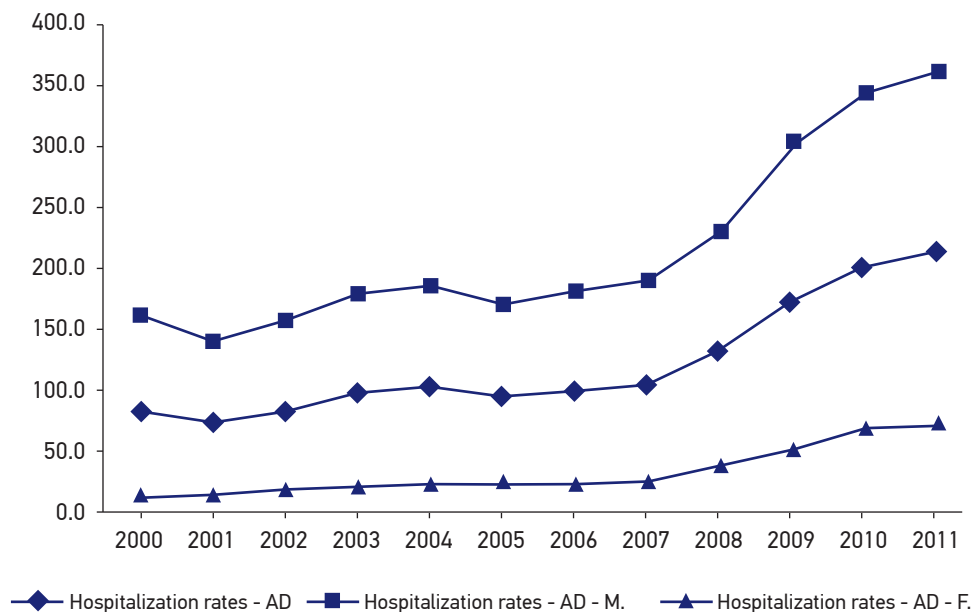
RESULTS

Throughout the studied period, an increase in hospital admission rates for mental and behavioral disorders due to the use of alcohol and other psychoactive substances was observed. The rates among men were higher than those noted for women (Graph 1). The rates among men were 160.9 hospitalizations per 100,000 inhabitants in 2000, reaching 362.9 hospitalizations per 100,000 inhabitants in 2011. Among women, these rates varied from 13.3 hospitalizations for 100,000 inhabitants in 2000 to 72.5 hospitalizations per 100,000 inhabitants in 2011 (Graph 1). In percentage terms, however, the increase in the rates of hospitalization for diagnoses related to the use of alcohol and other drugs among men was 125% in the period, whereas among women, it was 445%.

An increase in rates of hospital admissions resulting from other mental disorders was observed in the state of Rio Grande do Sul, for both genders. In 2000, they reached 159.2 hospitalizations per 100,000 inhabitants, increasing to 193.4 hospitalizations per 100,000 inhabitants in 2011. In the distribution between the genders, higher values were observed among men until 2007, when an inversion happened; from then on, women predominated, with 212.3 hospitalizations per 100,000 inhabitants in 2011, compared to 172.6 hospitalizations per 100,000 male inhabitants (Graph 2).

The analysis showed decrease in the mean length of hospital stay both for disorders caused by the use of alcohol and other drugs and other mental disorders. Throughout the period, the mean length of stay for the other disorders was higher than that for consumption of alcohol and other drugs. For diagnoses resulting from the consumption of psychoactive substances, the mean period of hospitalization had its highest value equal to 28.1 days in 2001 and the lowest of 16.1 days in 2009. As for the group of other disorders, the reduction was from 31.4 days, highest value, corresponding to the mean period observed in the year 2000, to 20.0 days, mean period in 2010 (Graph 3).

The Poisson regression for hospital admission rates due to mental disorders caused by the use of alcohol and other psychoactive substances showed positive coefficients for both



Hospitalization rates - AD: Total hospitalization rates for Disorders due to the use of alcohol or other substances;
 Hospitalization rates - AD - M: Hospitalization rates for Disorders due to the use of alcohol or other substances among men;
 Hospitalization rates - AD - F: Hospitalization rates for Disorders due to the use of alcohol or other substances among women.

Graph 1. Hospitalization rates for mental and behavioral disorders due to the use of alcohol and other psychoactive substances according to gender, Rio Grande do Sul, 2000 – 2011.

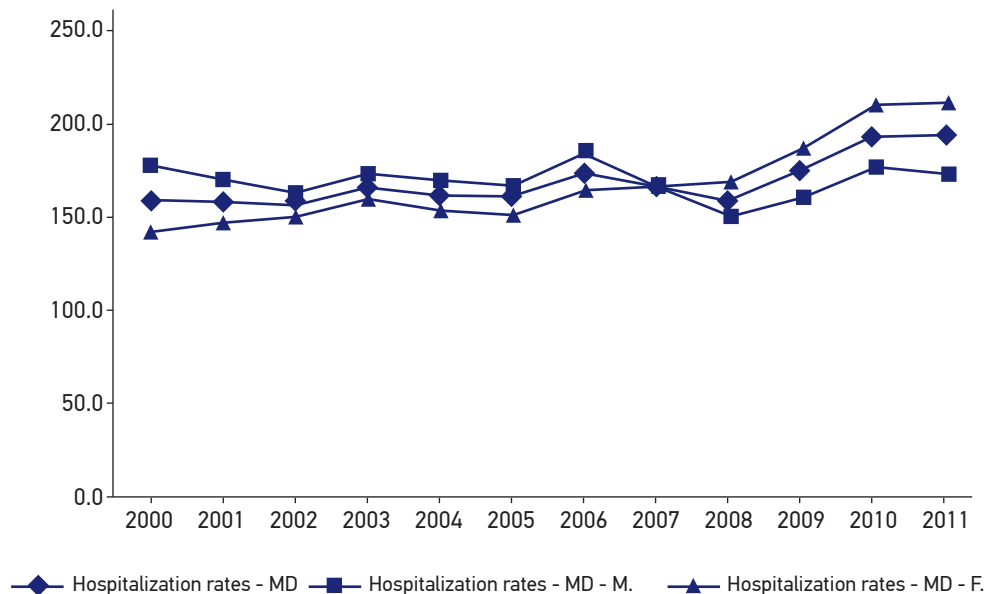
genders with statistical significance. The analysis confirmed the highest growth among women ($P = 1.18$, 95%CI 1.16 – 1.20; $p < 0.001$) (Table 1).

Regarding hospitalizations due to other mental disorders, the Poisson regression showed an increase in total, but this is due to the growth observed among women. Among men, it was not verified a statistically significant variation for the hospitalization rates in this group of diagnoses (Table 1).

Concerning the mean hospitalization periods, significant decreases in the regression coefficients for the two groups of diseases in both genders were observed. The coefficient of variation of the mean hospitalization periods showed greater reduction for disorders caused by the use of alcohol and other drugs among women, which was of 6.0% per year, on average ($P = 0.94$; 95%CI 0, 92 – 0.95; $p < 0.001$) (Table 1).

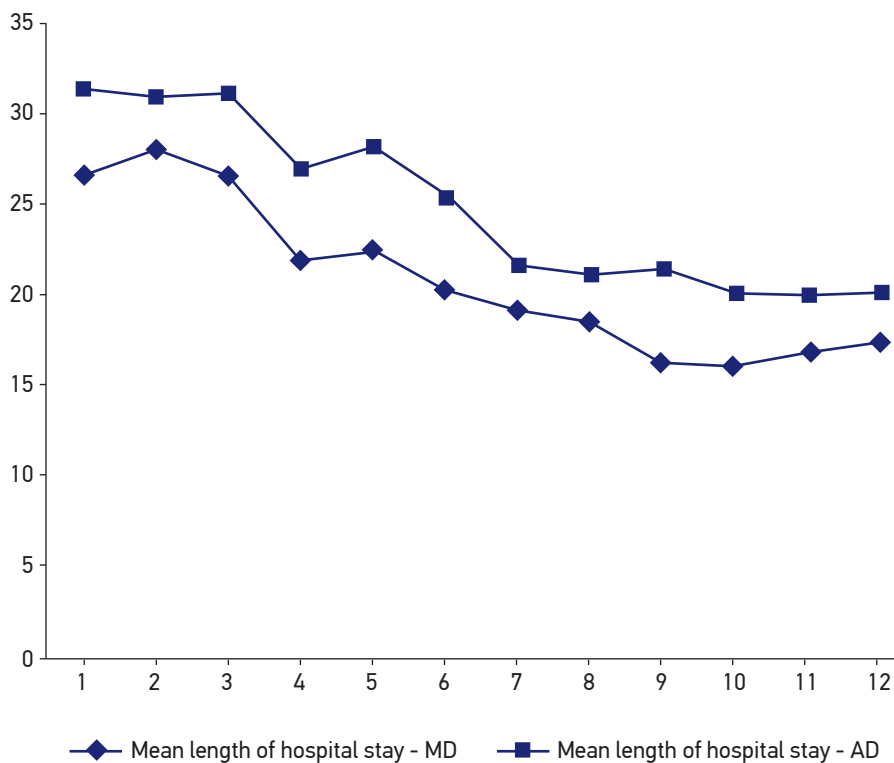
The regression models were evaluated and proved to be suitable according to the test.

Regarding the mean length of hospital stay, the expansion of psychiatric hospitalization rates among women, for both diagnosis groups, and for men, with regard to the disorders due to the use of alcohol and other drugs, showed strong negative correlation, with statistical significance. There was no correlation only for the group of male patients hospitalized for other mental disorders. In this group, a reduction was observed in the mean length of stay, but no increase in the rates during the period of the study was observed (Table 2).



Hospitalization rates - MD: Total hospitalization rates for other Mental Disorders; Hospitalization rates - MD - M: Hospitalization rates for other Mental Disorders among men; Hospitalization rates - MD - F: Hospitalization rates for other Mental Disorders among women.

Graph 2. Hospitalization rates for other mental and behavioral disorders according to gender, Rio Grande do Sul, 2000 – 2011.



MD: for other Mental Disorders; AD: for Disorders due to the use of alcohol or other substances.

Graph 3. Mean length of hospital stay for disorders due to the use of alcohol and other drugs and due to other mental and behavioral disorders, Rio Grande do Sul, 2000 – 2011.

Table 1. Poisson regression for hospitalization rates and periods of hospital stay for mental disorders according to gender and main diagnosis, Rio Grande do Sul, 2000 – 2011.

Main Diagnosis	Hospitalization Rates			Length of Stay		
	Regression Coefficient	95%CI	p-value	Regression Coefficient	95%CI	p-value
Disorders due to the use of alcohol and other drugs						
Masculine	1.09	1.07 – 1.11	< 0.001	0.95	0.94 – 0.96	< 0.001
Feminine	1.18	1.16 – 1.20	< 0.001	0.94	0.92 – 0.95	< 0.001
Total	1.10	1.08 – 1.13	< 0.001	0.95	0.93 – 0.96	< 0.001
Other mental disorders						
Masculine	1.00	0.99 – 1.01	0.58	0.96	0.95 – 0.96	< 0.001
Feminine	1.04	1.03 – 1.05	< 0.001	0.95	0.94 – 0.96	< 0.001
Total	1.02	1.01 – 1.03	< 0.001	0.95	0.94 – 0.96	< 0.001

Table 2. Spearman correlation coefficients for mean period of occupancy of beds and hospitalizations rates due to mental and behavioral disorders, according to gender and main diagnosis, Rio Grande do Sul, 2000 – 2011.

Main Diagnosis	Correlation Coefficient (ρ)	p-value
Disorders due to the use of alcohol and other drugs		
Masculine	-0.888	< 0.001
Feminine	-0.888	< 0.001
Total	-0.886	< 0.001
Other mental disorders		
Masculine	0.018	0.957
Feminine	-0.946	< 0.001
Total	-0.844	< 0.001

DISCUSSION

The analyzed data showed stability or growth in the rates of hospitalization accompanied by a reduction in the mean periods of hospitalization, simultaneously to the effective offer of substitute services in the state. In a study that also evaluated data about psychiatric hospitalizations in Rio Grande do Sul, from 2000 to 2004, the occurrence of admissions remained unchanged even with the effective implementation of substitutive services, with declining admissions in specialized hospitals and an increase of 97.7% in psychiatric hospitalizations in general hospitals¹³. The largest increase in the hospitalization rates identified here occurred from 2007 and 2008 on, with the stability already pointed out by Candiago and Abreu¹³ prevailing between 2000 and 2004.

The strengthening of local care networks for mental health, with the offer of mental health care in different cities of the state, may explain, at least partly, the fluctuations in the investigated rates^{13,19}. However, the implementation of local networks has not been homogeneous, because insufficient coverage of specialized services was observed in the same period in some regions of the state¹². In general, around the world, the implementation of community-based services has not determined the extinction of the need for hospital-based services¹⁹⁻²³.

Variations of these data in any direction should not be considered an indicator of quality of the services or networks^{7,24,25}. In this study, variables related to the services or reflections on quality are not being considered. An assessment in that direction should incorporate in the analysis, necessarily, the readmission rate of the patients to hospital beds. The source of data for this study does not allow this distinction, nor the inclusion in the analysis model of any other variable related to characteristics of individuals that are hospitalized, and this should be considered a limitation. It was not possible, in this analysis, to verify to what extent the registered hospitalizations were counted as more

than one event for the same individual. Thus, it is not possible to ensure that the increased rate of psychiatric hospitalizations represents a higher number of people taken care of in this assistance model.

The fluctuation of the variables gender and group of diagnoses, with a strong expansion of services provided to women and for the diagnoses related to substance use for both genders, strongly suggests that the rise in the rates is a result of the inclusion of a larger number of individuals in the list of users of the public health system that required attention in hospitals.

We do not rule out, however, the possibility of masked long stays, as described in the phenomenon of the *sliding doors*²³, in which the reentry of the same individual after short periods of stay outside the hospital sustains indicators of reduction in the mean length of hospital stay, which differs only slightly from the long formal stays^{6,24,25}. The phenomenon of *sliding doors*²³ and the growth in the population that accesses hospital services are not mutually exclusive and can occur simultaneously as well.

From the perspective of service management, the reform of mental health care model indicates, since its origins, the funds invested in hospitalizations could be reversed for the maintenance, improvement, and expansion of services in substitutive services^{1,3}. It is necessary to consider, however, that the expansion of the access of the population to mental health services can lead to an increased demand at all levels of assistance^{7,19,21,26}, requiring the expansion of the structure and technical capacity of care also in the hospital level.

One must also consider the possibility that psychiatric hospitalizations are not really sensitive to the articulation of local networks or that many links and compositions remain between services and professionals to allow post-hospitalization follow-up and effective integration between the different levels of care^{10,27,28}.

Anyway, the financing of the proposed model, not focused on hospital services, should not rely solely on the displacement of the hospital-level resources for the implementation of substitutive services^{19,20}. The data presented here indicate that the model really needs to contemplate both community-based and hospital-based services¹⁹. The assurance of an extensive network of community-based services, with special services such as therapeutic homes (for long stay) and hospital beds preferably in general hospitals, working in an articulated manner, needs to be supported by the budget of the public health care system¹⁹⁻²³. The expansion of local health networks, with mental health community-based services, in Rio Grande do Sul, also does not seem to indicate that the hospital beds will become obsolete.

The length of stay of the people at the hospital level, however, seems to be a sensible condition for the expansion of local health networks. The reduction in the mean periods of stay, confronted with the reduction in the number of hospital beds, allowed the public health system to absorb expansions of demands related to two contemporary issues of high relevance: the changes in gender relations and the movements of the drug market, with strong growth in the hospital care of women in general and drug users of both genders.

Among hospitalizations for diagnosis unrelated to the use of alcohol and other drugs, there is a reversal in the difference between the genders, with a higher proportion of women occupying the psychiatric beds. These data appear to be parallel to the advancement of women's emancipation movements and the fall of barriers set by distinctions associated with gender roles and expectations, with the women inserted in the public scene and in evidence, now also, in the circles of mental health care^{14,15,25}. This is not characterized necessarily as a negative indicator for social changes involving gender, but could instead suggest a greater possibility of expressing suffering and higher recognition of the need for this type of assistance.

As for the variation of the indicators related to hospitalizations for disorders due to the use of substances, the drugs that have specifically determined the registered hospitalizations were not mentioned, but the data may at least partly originate from the increased demand for hospital beds linked to the widespread use of crack²⁹. This drug has been described as capable of inducing damage quickly and it is easily perceived as associated with crime, aggressive behavior, and increase of health-related complaints in a general way^{30,31}. Crack users are 12.4 times more likely to die compared to the general population, through both injuries resulting from acute and chronic intoxication and the social risks³⁰. The intensity of its effects also appears when one examines the phenomena related to the abstinence syndrome³², and the protected environments end up representing greater security and greater possibility of immediate therapeutic response^{31,33}. Psychiatric beds in general hospitals are indicated as priorities by different authors and international organizations because of the recurrent interaction between typical clinical phenomena of mental health care, not only the disorders due to substance use and other health conditions^{19,21}.

The difference between men and women regarding crack use prevalence in the country²⁹ do not allow us to explain the increase in occupancy rates of hospital beds exclusively by the processes associated with the market of this substance. The rates have increased more among women, the very population group where crack use is less prevalent.

CONCLUSION

The data from this study suggested that the ongoing transformation in our society, so far, has passed with increased demand for hospital care in psychiatry. The contemporary patterns of consumption of alcohol and other drugs and the inclusion of women in a broad way in all markets accompanied the reform of the mental health sector, with the offer of services in the communities, for now, coming with higher rates of hospitalizations in psychiatry. This increase was supported in part by the achievement of one of the objectives of the sector's health care reform, with the proposed reduction in the mean periods of hospital stay.

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