Research Square

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Gender disparities in psychiatric hospitalizations in southern Brazil across the COVID-19 pandemic: a retrospective analysis

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Abstract

Purpose

To investigate gender-based trends in psychiatric hospitalizations at a private hospital in southern Brazil across pre-pandemic, pandemic, and post-pandemic periods.

Methods

Retrospective analysis of sociodemographic and clinical data from 3,701 hospitalizations between January 2019 and December 2022 was conducted.

Results

Total admissions decreased by 28.8% in 2020, followed by a gradual recovery thereafter. Women were consistently younger than men, with a more pronounced age difference in the post-pandemic period ($p < 0.001$). Length of stay and readmission rates increased for both genders during the pandemic, with higher values among men ($p < 0.001$). Women had significantly higher odds of involuntary hospitalization during the pandemic (OR = 1.49, 95% CI: 1.23–1.91). Across all periods, women were over three times more likely to be hospitalized for suicide risk (OR = 3.65, 95% CI: 3.17–4.19). Mood and personality disorders predominated among women, whereas substance use disorders were more common among men ($p < 0.001$).

Conclusions

Gender differences in psychiatric hospitalization patterns persisted before, during, and after the COVID-19 pandemic. These findings underscore the need for gender-responsive mental health strategies and strengthen the evidence base for planning future crisis preparedness.

Introduction

Mental disorders represent a major public health challenge worldwide due to their high prevalence, chronicity, and economic burden [1]. Over the past three decades, the global incidence and disability associated with psychiatric conditions — particularly depressive and anxiety disorders — have steadily increased, now ranking among the leading causes of disability-adjusted life years (DALYS)[1]. Gender, understood as a sociocultural construct encompassing behavior, identity, and social roles, influences both the epidemiology and clinical presentation of mental disorders [2]. Women are consistently reported to be about twice as likely as men to experience mood and anxiety disorders and to exhibit higher levels of disability, reflecting complex interactions between biological, hormonal, and sociocultural factors [1, 3, 4]. In addition to hormonal influences, social and structural inequalities,

including exposure to gender-based violence and disproportionate caregiving responsibilities, substantially contribute to women's heightened psychosocial vulnerability [3]. Gender differences are also evident in suicidal behavior: women attempt suicide about three times more often than men, whereas men have higher rates of suicide completion—a phenomenon known as the gender paradox in suicide [5].

The global mental health burden was further exacerbated by the COVID-19 pandemic, which triggered an unprecedented public health crisis with significant psychosocial consequences worldwide [6]. These effects stemmed from multiple interacting stressors, including social isolation, weakened social support networks, fear, grief, and economic hardship such as unemployment and financial insecurity [6]. It is estimated that during the first year of the pandemic, the global prevalence of anxiety and depressive disorders increased by 25%, reaching 33% in Latin America, with a greater impact on women [6]. This disproportionate effect reflects both pre-existing psychosocial vulnerabilities and the exacerbation of gender inequalities, including higher unemployment rates, increased domestic and caregiving demands, and elevated rates of gender-based violence [7].

Brazil was among the countries most severely affected by the pandemic, facing structural, socioeconomic, and political challenges [8–10]. Territorial disparities, social inequality, limited access to healthcare, delayed vaccination, and inconsistent government responses placed Brazil among the countries with the highest COVID-19 morbidity and mortality [8, 10, 11]. Even before the pandemic, Brazil already had one of the world's highest prevalence rates of anxiety disorders and depression-related disability [1, 12]. These conditions worsened markedly during the crisis, particularly among women and young people [13, 14]. Between 2020 and 2021, suicide mortality increased by 11.4%, with the highest rates observed in the southern region of the country and a higher risk among adolescent girls [15]. Self-inflicted violence also rose, with 70% of cases involving women, mostly adolescents and young adults [15]. These findings reinforce the importance of examining the mental health consequences of the pandemic from a gender perspective within the Brazilian context.

One approach to assessing the mental health impact of public health emergencies is through the analysis of psychiatric service utilization, which serves as an indirect indicator of psychosocial distress [16, 17]. Among the components of mental healthcare, psychiatric hospitalization represents the most intensive therapeutic resource, indicated when patients cannot be safely or adequately managed in less restrictive settings [18]. In Brazil, psychiatric admissions are regulated by federal law and classified as voluntary (with the patient's consent) or involuntary (without consent but authorized by a family member or legal representative), both requiring medical justification [18]. Changes in hospitalization patterns during the pandemic may therefore reflect variations in clinical severity, access barriers and service reorganization [8, 16].

Indeed, the COVID-19 pandemic led to a global restructuring of mental health systems, with 93% of countries reporting disruptions in one or more services for mental disorders [19]. Most international studies have reported marked declines in psychiatric admissions during the early months of the

pandemic and lockdown periods, followed by changes in diagnostic profiles and admission criteria [16, 20–23]. However, longer-term analyses suggest that significant changes in hospitalization patterns may also emerge in the post-pandemic period, indicating both immediate and delayed effects of the crisis on mental health [24, 25].

In Brazil, the studies identified so far have relied exclusively on data from the public health system—Sistema Único de Saúde (SUS, Unified Health System) — and have shown reductions in psychiatric admissions ranging from 8% to 33% after the onset of the pandemic [8, 26–31]. These studies attributed the decrease to a reduction in available psychiatric beds, health resources reallocation, and the compensatory role of community-based psychosocial care [8, 28]. Nevertheless, gender-focused analyses of psychiatric hospitalizations remain scarce both nationally and internationally. Furthermore, no Brazilian studies have examined the private healthcare sector, even though 46.5% of the country's psychiatric beds are in non-SUS facilities (private or philanthropic) [32]. Currently, 24.5% of the Brazilian population has access to medical care through private health insurance [33], and data from this sector indicate that between 2019 and 2022 the number of psychiatric hospitalizations increased from 211.9 to 267 thousand in this period [34].

Given the lack of national data addressing the impact of the COVID-19 pandemic on psychiatric hospitalizations from a gender perspective and within the private healthcare sector, as well as the importance of understanding both the immediate and delayed effects of the crisis on mental health, this study aimed to investigate these trends at a private psychiatric hospital in southern Brazil, through a retrospective analysis of sociodemographic and clinical data from 2019 to 2022, with particular emphasis on gender differences and on comparisons across pre-pandemic, pandemic, and post-pandemic periods.

Methods

Ethical aspects

The study was approved by the Research Ethics Committee of the Health Sciences Sector at the Federal University of Paraná (SCS/UFPR) in July 2022 under approval number 7.428.439. The requirement for informed consent was waived due to the retrospective design and the use of anonymized data.

Study design and setting

This was a retrospective, descriptive, and comparative cross-sectional study based on medical record reviews of patients admitted for psychiatric hospitalization between 1 January 2019 and 31 December 2022 at Hospital Heidelberg, a private mental health institution located in Curitiba, state of Paraná, southern Brazil. The hospital has 60 inpatient beds for voluntary and involuntary admissions. Hospitalizations were covered by private health insurance or paid out-of-pocket.

Period definition

The study period was divided into three phases according to official Brazilian legislation related to the COVID-19 health emergency:

1. Pre-pandemic: 1 January 2019–19 March 2020, prior to the national recognition of the public health emergency (Legislative Decree No. 6, 20 March 2020) [35];
2. Pandemic: 20 March 2020–20 March 2022, corresponding to the duration of the national state of public health emergency;
3. Post-pandemic: 21 March 2022–31 December 2022, following the end of the national emergency (Ordinance GM/MS No. 913, 22 April 2022) [36].

Participants and data collection

All patients admitted for psychiatric hospitalization during the study period, regardless of gender, age, or place of residence, were eligible for inclusion. Records that were incomplete, illegible, or unavailable were excluded.

Data collection occurred between September 2022 and September 2024 from physical medical records. The research team comprised the principal investigator and six trained psychiatrists to ensure standardized data extraction. Data were transcribed into a secure digital platform accessible only to the principal investigator, reviewed for consistency, and organized in Microsoft® Excel prior to statistical analysis.

The variables extracted included: patient identifier, sex, date of birth, dates of admission and discharge, type of hospitalization (voluntary or involuntary), main psychiatric diagnosis according to the International Classification of Diseases—10th Revision (ICD-10) [37], and presence of suicide risk.

Statistical analysis

Descriptive statistics were used to summarize the data, with absolute and relative frequencies for categorical variables and measures of central tendency and dispersion for continuous variables. The Shapiro–Wilk test was used to assess normality. The Mann–Whitney U test was applied to compare two independent groups for non-normally distributed continuous variables. Associations between categorical variables were assessed using the chi-square test and odds ratio (OR) with 95% confidence interval (CI), and differences between proportions were evaluated using the z-test. A significance level of 5% was adopted. All analyses were performed using R software, version 4.2.1.

Results

A total of 3,701 psychiatric hospitalizations were analyzed, comprising 1,833 (49.5%) admissions of women and 1,868 (50.5%) of men throughout the study period. Compared to 2019, the total number of

admissions decreased by 28.8% in 2020, followed by a gradual recovery trend in 2021 and 2022 (Fig. 1).

Women were consistently younger than men, with median ages of 33, 35, and 30 years in the pre-pandemic, pandemic, and post-pandemic periods, respectively, compared with 36, 38, and 35 years among men (Table 1). The age gap was more pronounced during the post-pandemic period ($p < 0.001$).

Table 1
Age distribution of women and men hospitalized for psychiatric treatment across pre-pandemic, pandemic, and post-pandemic periods

	Women				Man				
Period	M	MD	DP	IIQ	M	MD	DP	IIQ	p-value
Pre-pandemic	35,3	33	15,8	22–46	36,7	36	14,1	26–47	0,019
Pandemic	35,0	35	15,4	22–45	36,4	35	13,3	26–45	0,007
Post-pandemic	33,2	30	15,5	20–43	36,4	35	14,7	25–44	< 0,001

M = mean; MD = median; SD = standard deviation; IQR = interquartile range; p = p-value obtained from the Mann–Whitney U test comparing genders within each period.

The length of hospitalization increased in both genders during the pandemic and post-pandemic periods compared with the pre-pandemic period. This increase was more pronounced among men, particularly during the pandemic ($p < 0.001$). Readmissions increased during the pandemic period and were more frequent among men than women ($p < 0.001$). Involuntary hospitalizations increased during the pandemic and post-pandemic periods in both genders, however, during the pandemic, the proportion of this type of admission was significantly higher among women, who had nearly 1.5 times greater odds of involuntary hospitalization (OR = 1.49; 95% CI: 1.23–1.91). These data are summarized in Table 2.

Table 2
Unified descriptive data by gender and study period.

Period	Variable	Women	Men
Pre-pandemic	Length of stay (median, IQR)	14 (7–23)	16 (7–26)
	First admission (%)	90.1	87.9
	Readmission (%)	9.9	12.1
	Voluntary (%)	63.2	66.1
	Involuntary (%)	36.8	33.9
Pandemic	Length of stay (median, IQR)	17 (8–27)	21 (9–30)
	First admission (%)	85.5	77.9
	Readmission (%)	14.5	22.1
	Involuntary (%)	54.7	44.6
	Voluntary (%)	45.3	55.4
Post-pandemic	Length of stay (median, IQR)	17 (6–28)	19 (9–28)
	First admission (%)	90.5	87.4
	Readmission (%)	9.5	12.6
	Involuntary (%)	48.2	49.7
	Voluntary (%)	51.8	50.3

Across all study periods, the diagnoses most associated with psychiatric hospitalizations — without variation over time — were mood disorders (ICD-10: F30–F39) and personality and adult behavior disorders (ICD-10: F60–F69) among women ($p < 0.001$), and substance use disorders (ICD-10: F10–F19) among men ($p < 0.001$). No significant gender differences were observed for psychotic disorders—including schizophrenia, schizoaffective disorder, and delusional disorders (ICD-10: F20–F29) ($p = 0.117$).

Hospitalizations due to suicide risk were significantly higher among women than men across all three study periods (Fig. 2). Considering the entire study period, women had more than three times higher odds of being hospitalized for suicide risk (OR = 3.65; 95% CI: 3.17–4.19).

Discussion

This study provides novel evidence on the impact of the COVID-19 pandemic on psychiatric hospitalizations at a private hospital in southern Brazil — a region that accounts for one of the country's highest hospitalization rates [30] and where 34% of psychiatric beds are in the private sector [32]. By

comparing women and men across different phases of the pandemic, the findings reveal the interplay of clinical and sociocultural factors influencing hospitalization patterns during and after the COVID-19 crisis.

Unlike national investigations based on public health system (SUS) data, which consistently reported a predominance of male psychiatric admissions both before and during the pandemic [26, 29, 31], the present study found no significant gender difference in the overall number of hospitalizations. This divergence may be explained by the study setting, as previous analyses focused on public facilities, whereas the current research was conducted in a private hospital. In this context, regional, socioeconomic, and cultural differences likely shape psychiatric hospitalization patterns[38], consequently influencing gender distributions.

A 28.8% reduction in psychiatric admissions was observed in 2020, consistent with findings from Brazilian studies [8, 26–31] and international research [16, 20–25]. This pattern reflects both a decrease in demand — driven by fear of contagion and lockdown measures — and hospital restrictions that prioritized more severe cases.

Women were consistently younger than men across all periods, with a more pronounced difference after the pandemic. This finding aligns with national and international evidence indicating that young women were disproportionately affected by the psychosocial consequences of the COVID-19 crisis [4, 6, 13, 15, 34].

The length of hospital stay increased compared with the pre-pandemic period for both genders, with a more pronounced rise among men during the pandemic. This finding contrasts with national studies[8, 28], but is consistent with results from other countries [16, 21]. In Brazil, Gadelha et al. [28] and Ornell et al. [8] attributed this finding to the decreased availability of psychiatric beds (related to distancing measures between beds and the reallocation of resources and staff to COVID-19 care) as well as to the expansion of compensatory strategies, such as partial hospitalization programs, intensive outpatient care at Psychosocial Care Centers (CAPS), and home visits provided by primary healthcare teams. Unlike the public health system, however, private hospitals might have assumed stricter admission criteria during the pandemic, likely resulting in the admission of patients with more severe clinical conditions, leading to longer hospitalizations [21].

These factors are also related to the increase in readmission rates observed in both genders, which was more pronounced among men during the pandemic. Psychiatric readmission may reflect clinical relapse, weakened social and family support, poor adherence to treatment, and barriers to accessing medications and community-based care [39, 40]. Therefore, the increase in readmissions during the pandemic suggests a worsening of clinical conditions, alongside a weakening of social support networks and health system responsiveness during that period. The literature further identifies male sex and substance use disorders as key risk factors for psychiatric readmissions [39, 40], which may partially explain our findings, given the predominance of substance-related diagnoses among men. Considering the absence of national data on psychiatric readmissions in official Ministry of Health

reports [29, 40], these finding gain relevance, as most comparable studies relied solely on public health datasets.

Another significant finding was the increase in involuntary hospitalizations during the pandemic, particularly among women, who presented with an almost 1.5 times higher risk than men. Researchers from other countries, such as Bonello et al.[20] and Warwicker et al.[25], similarly to this study, identified an increased rate of involuntary admissions linked to the prevalence of hospitalizations related to mood disorders or suicide and self-harm risk. Considering that, in our sample, most women were admitted for mood disorders and suicide risk, it is possible to infer that these cases presented with greater severity during the pandemic period, reflecting the aggravation of risk factors such as the rise in gender-based violence and socioeconomic vulnerability [7]

Gender differences in diagnostic profiles were consistent with similar studies from Ribeiro et al.[29] and Carvalho et al.[26], with men predominantly admitted for substance use disorders while women predominated in mood and personality disorders. However, no significant differences were found for psychotic disorders. This finding contrasts with results from other Brazilian studies [29, 30], a discrepancy that may be attributed to the heterogeneity of psychiatric care structures across the country and to distinct socioeconomic contexts influencing access to treatment.

Among women, there was a more than threefold higher risk of hospitalization for suicidality across all periods analyzed, compared to men. This finding aligns with the recognized epidemiological phenomenon in which women present with three times more suicide attempts than men [5]. However, no significant variations in this variable were observed across the pre-pandemic, pandemic, and post-pandemic periods. Given that this variable is more difficult to measure — since there is no specific diagnostic code for suicide risk at the time of admission — this finding represents an important contribution of the present study, as it has not observed in other similar national investigations [8, 26–31].

Despite the relevant findings, this study has limitations. The retrospective design implies a dependence on hospital records produced for assistance purposes, which are subject to incompleteness, lack of standardization, and errors. Furthermore, as this study was conducted at a private hospital located in Southern Brazil, the results may not be generalizable to other regional contexts or to the public healthcare network. It is also not possible to establish causal relationships, since the study only allows for the identification of associations.

On the other hand, the study presents important strengths. The sample size and the analysis of different phases of the pandemic enabled consistent temporal comparisons. Other relevant aspects were the stratification by gender, which allowed for the identification of specific vulnerabilities, and the focus on the private sector, which is still underexplored in the national literature. These results offer support for improving psychosocial strategies and formulating public policies sensitive to gender issues and the role of supplementary health, especially given the growing demand for mental health assistance in Brazil [34].

Clinically, these findings underscore the need for heightened vigilance during periods of intense psychological stress and weakened social support — such as public health crises — given the increased predisposition of women, particularly younger women, to mood disorders and suicidality, and the greater vulnerability of men to substance use disorders. In this sense, the study provides evidence that can guide decision-making in future health emergencies. Further research is needed to deepen the understanding of the pandemic's impact on mental health in Brazil, taking into account epidemiological differences across genders, regions of the country, and public versus private healthcare systems.

Conclusions

This retrospective analysis investigated trends in psychiatric hospitalizations at a private hospital in southern Brazil across pre-pandemic, pandemic, and post-pandemic periods, focusing on gender-specific differences. Results indicated a substantial reduction in admissions during the pandemic, alongside factors suggesting increased clinical severity for both genders, evidenced by longer hospital stays, higher rates of involuntary admissions, and greater readmission rates. However, patterns of vulnerability differed between genders: men showed a more pronounced increase in hospitalization length and readmissions during the pandemic, and a predominance of substance use disorders. Conversely, women were consistently younger than men and presented more than threefold higher odds of hospitalization for suicidality across all periods, as well as a 1.5-fold higher likelihood of involuntary admission during the pandemic. These findings underscore the differential impact of the COVID-19 crisis and highlight the necessity of gender-sensitive strategies in mental healthcare. The data provide valuable evidence to guide more effective clinical care, particularly for women experiencing severe psychological distress, and to inform the strengthening of psychosocial support systems in Brazil, both in public and private settings and in preparation for future public health crises.

Declarations

Competing Interests

The authors declare no competing interests.

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Author contributions

FMS and SCZR developed the study conception, design and methodology. Material preparation, data collection and analysis were performed by FMS, RMN, LRN, HCZ, IMA, MZS, PHTH and RV. FMS, RMN,

LRN, HCZ, IMA, MZS, PHTH, RV and SCZR contributed to the writing, reviewing and editing of the manuscript. All authors gave approval of the version that was submitted for publication.

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Data availability

The data associated with this paper are available from the corresponding author upon request.

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Figures

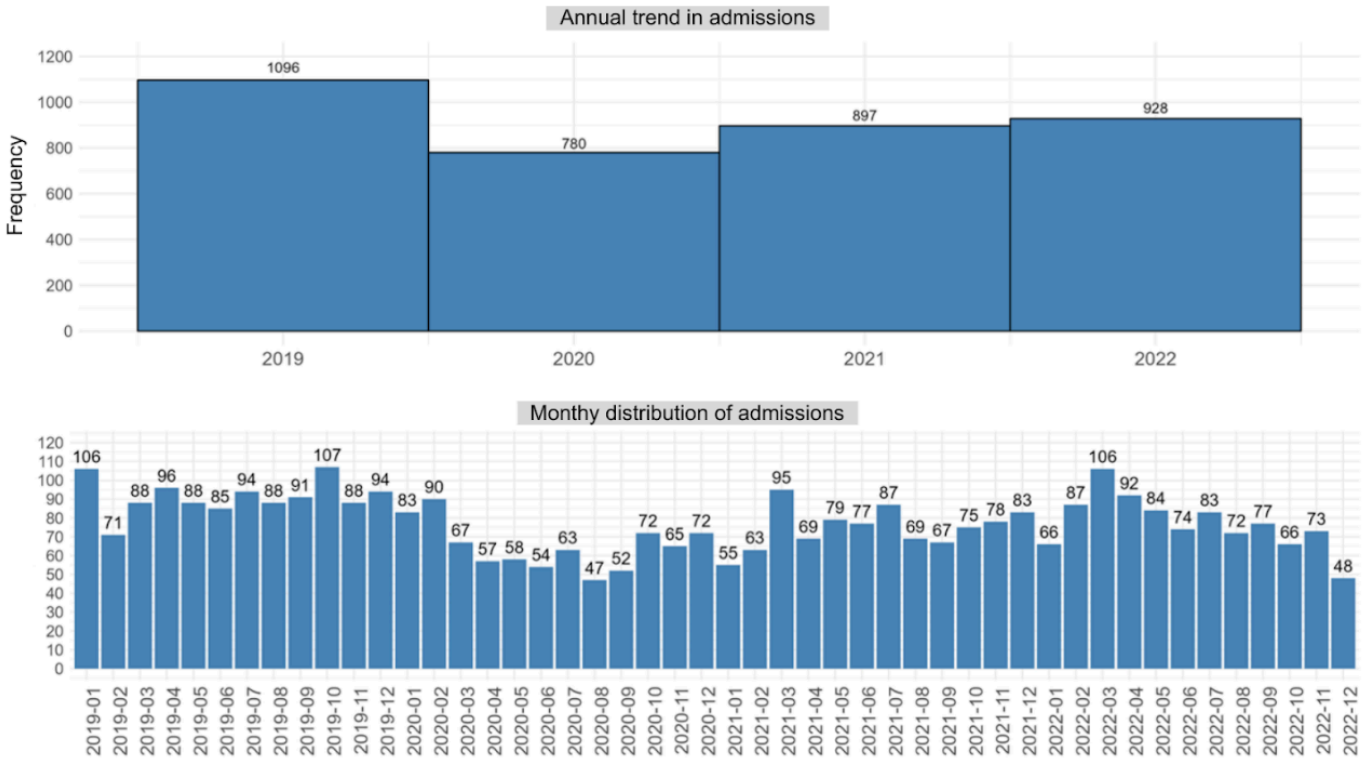


Figure 1

The upper panel shows the total number of psychiatric hospital admissions per year, and the lower panel presents monthly distributions across the study period. A marked decline was observed in 2020, followed by partial recovery in 2021 and 2022.