

DECLINE IN SCHIZOPHRENIA AND SCHIZOPHRENIA SPECTRUM DISORDERS IN BRAZIL: A CROSS-SECTIONAL STUDY FROM 2013 TO 2019

DECLÍNIO DE ESQUIZOFRENIA E TRANSTORNOS DO ESPECTRO ESQUIZOFRÊNICOS NO BRASIL: UM ESTUDO TRANSVERSAL DE 2013 A 2019

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ABSTRACT

Since 2015, as a sign of setback, the Ministry of Health stopped publishing the data regarding the investments of Mental Health Services, in particular, Centers for Psycho-Social Care (*Centros de Atenção Psicossocial*, CAPS). Among the psychiatric diseases, schizophrenia is one of the most serious and disabling disorders in Brazil. In this context, the aimed of this study is to analyze the Brazilian profile of schizophrenia and schizophrenia spectrum disorders from 2013 to 2019. During the studied time, the hospitalization by schizophrenia and schizophrenia spectrum disorders committed more males (304.793) compared to females (192.887). In males, hospitalization was more prevalent in aged 30-39 followed by 20-29, 40-49, 50-59, 60-69, 70-79, and 80 or older. Interestingly, a different profile was seen in females, women aged 40-49 were more hospitalized, followed by 30-39, 50-59, 20-29, 60-69, 70-79, and 80 or older. Decreasing the rate of hospitalization in subjects aged 30 and more, and a steady rate in individuals aged 20 years old in both sexes. The data showed a decrease of hospitalization in subjects aged 30 or more and no difference in younger age over time, these findings may indicate in short-term the schizophrenic spectrum hospitalization did not have an impairment.

KEYWORDS: Schizophrenia; Brazil; Hospitalization; Mental Health Services.

1. INTRODUCTION

Mental disorders have emerged as a global health issue¹. Highly prevalent worldwide, it is estimated that one in four people will be diagnosed with a psychiatric disease during the lifetime². It was reported that 31% of work disability is related to neurologic and psychiatric disorders worldwide³. Besides the high rate of disability, in a Brazilian study was reported re-hospitalization due to mental illness is approximately 42.6% in one year⁴.

Among the mental disorders, schizophrenia is an important psychiatric disease, considered as one of the most serious and disabling disorders, characterized by symptoms such as, delusions, disorganized communication, hallucinations, reduced motivation, apathy, and poor planning, which affects approximately 1% of the population⁵. Schizophrenic patients live on average 17 years less comparing with people undiagnosed for major mental diseases. Besides mortality due to suicide, two-thirds of the schizophrenic-premature deaths are related to diabetes, cardiovascular and smoking-related diseases⁶. In this regard, the earlier diagnosis for this psychiatric disease has an important impact and a successful treatment can prolong schizophrenic patients' life.

Previous reports addressed several pathways in order to understand the biological link in schizophrenia, schizotypal and delusional disorders. It's known heritability is the major risk factor for these diseases, increasing the odds up to 80%⁷. Some studies showed that polymorphisms in several genes could affect schizophrenia, schizotypal and delusional disorders, such as, presence of α -1C subunit of the L-type voltage-gated calcium channel (*CACNA1C*) gene, as a significant risk gene for schizophrenia⁸ and polymorphisms in multidrug resistance 1 (*MDR1*) gene is related to greater severity of delusions and hallucinations⁹. However, due to the complex pathophysiology of mental illness, the biological link between these disorders is unclear.

Besides the biological influence of schizophrenia and its spectrum, it is important to highlight the Brazilian Psychiatric Reform though the implementation and expansion of Centers for Psycho-Social Care (*Centros de Atenção Psicossocial*, CAPS) according to the Decree 189/1991, 224/1992 e 336/2002. From 1990 and 2010, there was a crucial increase of implementation of CAPS from 12 to 1620 in the counties, respectively, which represent an

average 25% increase per year¹⁰. Since 2006, CAPS overcame the numbers of psychiatric hospital, which is a reflex of the Brazilian progressive government in the 2000s. Although, in 2011 the expansion of CAPS was settled, and in 2015 together with the end of the progressive government in Brazil, as a sign of a setback, the Ministry of Health stopped publishing the data regarding the expansion and investments of CAPS¹¹. Besides the lack of transparency, psychiatric care in Brazil has been continuously unfunded, according to the World Health Organization, 5% of the health budget should be invested in mental care, in the Brazilian scenario only 2.3% is invested in this area¹².

The majority of epidemiological reports regarding schizophrenia and its spectrum were carried out in developed countries^{13,14}. There is little information about this subject in developing countries, in particular Brazil. In this regard, prevalence studies are important to understand trends related to a specific disease, which may help the governments to plan and to track strategic interventions. To our knowledge, there are no cross-section-based studies on schizophrenia, schizotypal and delusional disorders characterizing the Brazilian profile. This study aims to analyze and discuss the epidemiology of hospitalization due to schizophrenia, schizotypal and delusional disorders from 2013 to 2019 in Brazil and the social aspects that it is involved in this context.

2. METHODS

Population

This is a cross-section study conducted in March 2020 and was included cases of hospital admission reported as schizophrenia schizotypal and delusional disorders in Brazilian subjects aged 20 to 80 or older. The inclusion criterion was defined as subjects within the above-mentioned age who were living in Brazil from 1st January 2013 until 31st December 2019.

The data were extracted from the Department of Informatics of the National Health System (*Departamento de Informática do Sistema Único de Saúde*, DATASUS)/Ministry of Health (*Ministério da Saúde*, MS) available on the website of the DATASUS (MINISTRY OF HEALTH) and the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*, IBGE)¹⁶. The data are part of the universal accessibility policy of the Brazilian public health care system¹⁷. Therefore, the subject's data are not identified individually. This study does not require an ethics committee approval.

This information includes basic and associated causes, based on the 10th International Classification of Disease (ICD). The collected data by the Municipal Health Secretaries (MHS), registered in a national database and freely available for consultation. SIM (*Sistema de Informação de Mortalidade*) data collection methodology did not change during the study period. In this study we used the ICD version 10 (ICD-10) codes on DATASUS: F20-F29 for schizophrenia, schizotypal and delusional disorders.

The extracted demographic data of the population of the Brazilian federal units and regions obtained from the IBGE, which runs a census every 10 years to verify the Brazilian population profile and estimates by projections the population size in the years between censuses.

Analyses

For the proportional of rates, we used population by sex and age, or the calendar year as the denominators, and a total of hospitalization as the numerator, as described below.

$$\text{Hospitalization}_{\text{sex and age}} = \frac{\text{number of hospitalization}}{\text{total population in the range}} \times 10^5$$

3. RESULTS

From 2013 to 2019, it was seen the decreased rate of hospitalization caused by schizophrenia, schizotypal and delusional disorders from 82.006 to 69.030 in both sexes (Table 1). From the total, Southeast region was the most prevalent hospitalization with 42.35% in men and 44.70% in women, followed by Northeast 25.78% and 23.95%, South with 19.09% and 18.08%, Midwest 8.04% and 8.24%, 4.74% and 5.03% in North, in males and females, respectively.

In the male population, in absolute numbers, 304.793 hospitalizations were seen during the study time, more prevalent in men aged, 30-39, followed by 20-29, 40-49, 50-59, 60-60, 70-79 and 80 or older. A profile of older subjects was seen in females, 192.887 hospitalizations were reported, more prevalent in women aged 40-49, followed by 30-39, 50-59, 20-29, 60-69, 70-79 and 80 or older (Table 01).

Table 1. Frequency of hospitalization by Schizophrenia, schizotypal and delusional disorders in male and female subjects by age and calendar year.

Age (years old)	Male		Female	
	n	% (95% CI)	n	% (95% CI)
20-29	80,815	26.51 (26.67; 26.36)	30,688	15.90 (16.07; 15.74)
30-39	86,609	28.41 (28.57; 28.25)	47,972	24.88 (25.06; 24.67)
40-49	68,359	22.43 (22.57; 22.27)	51,586	26.75 (26.64; 26.54)
50-59	47,775	15.68 (15.80; 15.54)	41,134	21.32 (21.50; 21.14)
60-69	16,662	5.47 (5.54; 5.38)	16,141	8.37 (8.49; 8.24)
70-79	3,644	1.20 (1.23; 1.15)	4,131	2.14 (2.20; 2.07)
≥ 80	929	0.30 (0.32; 0.28)	1,235	0.64 (0.67; 0.60)
Calendar Years	n	% (95% CI)	n	% (95% CI)
2013	50,051	16.42 (16.55; 16.28)	31,955	16.57 (16.73; 16.40)
2014	46,679	15.31 (15.44; 15.18)	30,594	15.86 (16.02; 15.69)
2015	43,767	14.38 (14.48; 14.28)	28,248	14.65 (14.80; 14.48)
2016	40,848	13.40 (13.52; 13.28)	25,812	13.38 (13.53; 13.23)
2017	40,016	13.12 (13.24; 13.00)	24,898	12.91 (13.05; 12.75)
2018	40,668	13.34 (13.46; 13.22)	25,114	13.02 (13.17; 12.87)
2019	42,764	14.03 (14.15; 13.90)	26,266	13.61 (13.77; 13.46)
Total	304,793	100	192,887	100

CI = confidence interval.

When comparing the hospitalization rate normalized by their respective population, the profile changes, the highest number of hospitalizations in men were seen in 40-49, 30-39 years old followed by 50-59, 20-29, 60-69, 70-79 and 80 or older (Figure 1). Interestingly, the hospitalization rates decreased in all ages, except 20-29 years old, where we found a steady decrease from 2013 to 2016, followed by an increase from 2016 to 2019 resulting in similar data of hospitalization between 2013 and 2019.

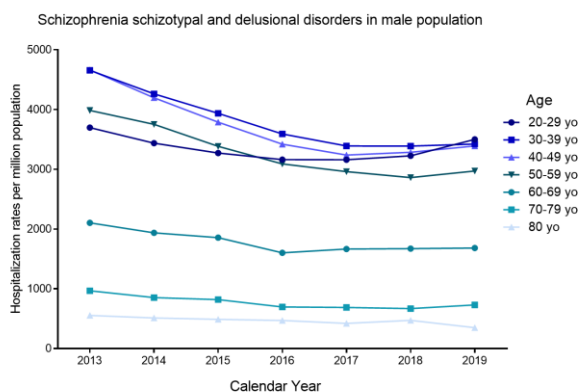


Figure 1. Distribution of hospitalization by schizophrenia, schizotypal and delusional disorders according to age in males normalized by their respective population. Rates per 1,000,000 inhabitants. yo = years old.

Different profiles were also seen in the female population when normalized, the hospitalization was higher in older women (Figure 2), 40-49 and 50-59 years old were more prevalent, followed by 30-39, 60-69, 20-29, 70-79 and 80 or older. Similar to the male prevalence, in all ages, a decreasing rate is reported, except 20-29 years old, where similar hospitalization was reported in 2013 and 2019.

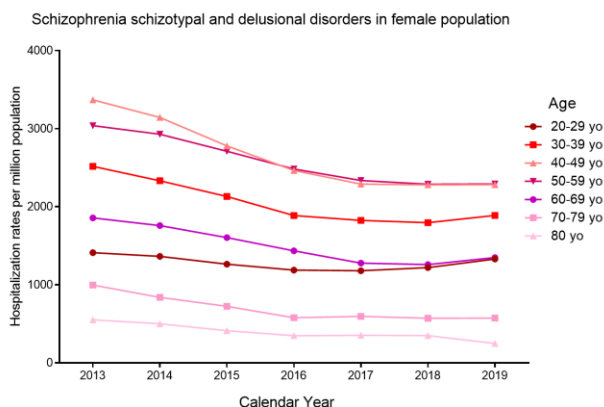


Figure 2. Distribution of hospitalization by schizophrenia, schizotypal and delusional disorders according to age in females normalized by their respective population. Rates per 1,000,000 inhabitants. yo = years old.

4. DISCUSSION

In the present epidemiological study, we have demonstrated a decreasing rate of hospitalization by schizophrenia, schizotypal and delusional disorders over 30 years old between 2013 and 2019 in both sexes. Moreover, we reported a steady rate of hospitalization in subjects aged 20-29 at the same time. The highest prevalence is shown in the male population aged 20-69 when compared to the female, although in older subjects the prevalence is higher in female subjects.

A United States study¹⁸ showed a higher hospital admission by schizophrenia and its symptoms in patients aged 46-67 years old followed by 36-45 and 18-35. An epidemiologic study from Czech Republic¹⁹

was reported higher rates of hospitalization by these disorders in an age-dependent manner, more prevalent in subjects aged 30-39 followed by 40-49 years old were more hospitalized by these disorders. Although the studies do not analyze the same age range, it was shown that in the United States report older subjects are more hospitalized comparing with ours and Czech study. It is known that schizophrenic disorder is closely related to psychosocial interaction and may be triggered by it²⁰, so, a possible explanation for different ages hospitalized by countries culture and lifestyle.

In previous reports in the Danish population was seen a time-dependent increasing hospital admission incidence of schizophrenia, schizotypal and delusional disorders in subjects aged 5 to 32 years old and a decreased rate in subjects aged 33 or older in both sexes, with higher rates in subjects aged 19-24 followed by 25-32 years old²¹. Although, we have shown a steady decline in subjects aged from 30 to 80 or older and no differences between 20 and 29 in both sexes. We addressed the decline to i) popularization of CAPS and/or ii) the lack of recognition of early symptoms and/or search from Brazilians for professional help.

A previous report²² was demonstrated that 94%, 90% and 76% of Brazilians believe that schizophrenic symptoms are related to drug use, isolation and lack of faith in God, respectively. In Brazil, a developing country, and the majority of catholic, it is important to highlight the role of religion in psychiatric diseases. Religion can be playing a key role in the feeling of self-punishment and judgment by society²³. These aspects can contribute to social exclusion and lack of search for the treatment of people who suffer from schizophrenic symptoms.

Interestingly, in a total of hospital admission in the aged female are more numerous comparing to males. Different from several diseases, such as diabetes²⁴, hypertension²⁵ and urological symptoms^{26,27}. In the younger population, the schizophrenia symptoms are massive higher in males, although, with onset at 60 years or later (very-late-onset schizophrenia-like psychosis, VLOSLP) are more prevalent in females. However, good outcomes are related to VLOSLP such as clinical symptoms and better response to pharmacological treatment comparing with younger subjects²⁸.

Our results showed a similar steady trend of hospitalization rate in men and women aged from 20 to 29 years old over the years, however, it is inaccurate to predict the reason. Although, many studies showed a close relationship between mental health and drug use, such as the dose-response effect of cannabis and alcohol abuse in psychosis symptoms²⁹. Since the highest rates of drug use are reported in this age³⁰, we hypothesize higher hospitalization rates by unspecified psychosis that its usually registered as delusional disorders.

There are some methodological limitations in this report that worth taking into consideration. First, the

collection of the data was by electronic health records, and even mandatory, a potential missing data and incorrect records may have been added. Second, in some regions of Brazil, the access to medical care is minimal and the records of the accurate data mainly in these regions can be underestimated. Third, in this study, we cannot distinguish between first hospitalization and re-hospitalization.

5. CONCLUSION

Collectively, we present here a comprehensive report of hospitalization from schizophrenia schizotypal and delusional disorders across Brazil. The 7-year study period and numbers exceeding 497,680 subjects provides a trend demonstration of hospitalization and divided by age, sex and year. This report indicates a decreasing trend of hospitalization and by these disorders in Brazil in subjects over 30 years old, highlighting the important effect of the health policy in reducing the rates of morbidity related to mental illness more specifically in subjects aged between 20 and 29 years old. Moreover, we also demonstrated an age-, sex-dependent effect in the rates of hospitalization. Besides the lack of transparency by the Brazilian Ministry of Health with the CAPS budget since 2015, during the studied time, there was a decreasing rate of hospitalization by schizophrenia, schizotypal and delusional disorders in Brazil. These data are crucial for the planning of mental services targeting mainly younger subjects hospitalized by schizophrenia schizotypal and delusional disorders.

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