

## ORIGINAL ARTICLE

# Child and Adolescent Psychosocial Care Center service use profile in Brazil: 2008 to 2012

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**Objective:** To describe the service use profile of Child and Adolescent Psychosocial Care Centers (Centro de Atenção Psicossocial Infanto-Juvenil [CAPSi]) in Brazil regarding diagnostic categories, sociodemographic aspects, and care modalities between 2008 and 2012.

**Methods:** A descriptive, ecological study was performed using data from the Unified Health System regarding high-complexity procedure authorizations (Autorização de Procedimentos de Alta Complexidade [APAC]) for the period from 2008-2012. The variables sex, age, diagnosis (F00-F99 of ICD-10), and type of care provided were examined. The data were processed using TabWin and STATA version 12.

**Results:** A total of 837,068 records were examined, each representing one visit to CAPSi. Most visits were by male users (68.8%). The most common diagnoses were hyperkinetic disorders (13%), pervasive developmental disorders (12.4%), and conduct disorders (8.4%).

**Conclusions:** Behavioral and emotional disorders that usually appear during childhood or adolescence and psychological development disorders were frequent, with more than 50% of the latter comprising autism spectrum disorders. Regional differences were observed, with a higher presence of this diagnosis in the Southeast, while the North and Northeast had a high percentage of visits due to mental retardation.

**Keywords:** Mental health problems; children/adolescents; epidemiology; mental health service

## Introduction

The worldwide prevalence of mental disorders among children and adolescents ranges from 13 to 20%, making mental health in this age group a priority for the global health agenda.<sup>1,2</sup> In Brazil, prevalence rates of mental disorders among children and adolescents have been estimated at 12.7 to 19.9%,<sup>3</sup> with 4 to 13% requiring clinical intervention. However, only one in five children or adolescents in Brazil receive adequate care,<sup>4</sup> due to a shortage of specialized services, especially in the country's North and Midwest regions.<sup>5</sup>

The gap between the need for treatment of mental disorders and the provision of care is a global issue: no treatment is provided to 76 to 85% of people with severe mental disorders in low- and middle-income and 35 to 50% in high-income countries.<sup>6</sup> In 36 European countries, the degree of coverage and quality of services for young people was of poorer quality compared to the services provided for adults.<sup>7</sup> In addition, mental health services and policies for children and teenagers are generally lacking<sup>8</sup>: of high-income countries, 88.9% have a mental health policy targeting this group, and of low-income countries, only 25% have such policies. Paradoxically, the countries

with a higher proportion of children and adolescents were also those with the greatest lack of mental health policies for this population group.<sup>8</sup>

Historically in Brazil, mental health care for children and adolescents has been oriented toward institutionalization, and far removed from an integrated care model.<sup>9</sup> Nevertheless, a drastic change in public policies took place in 2001, based on the recommendations of the Third National Conference on Mental Health.<sup>10</sup>

As a key part of this new policy, centers for psychosocial care (Centros de Atenção Psicossocial [CAPS]) were established, with mental health services being integrated into the Brazilian public Unified Health System (Sistema Único de Saúde [SUS]).<sup>11</sup> CAPS provide day-to-day community health care services for people with serious mental illness within a catchment area; the services provided vary according to the needs of users and the capacity available.<sup>11</sup> Within this framework, CAPS for children and adolescents (Centros de Atenção Psicossocial Infanto-Juvenil [CAPSi]) were also created.<sup>10</sup>

Previous studies on CAPSi have adopted qualitative methodologies<sup>12-14</sup> or relied on literature review and policy analysis, with few quantitative studies covering a significant number of units. Two national surveys have described the

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nosologic profile and sociodemographic characteristics of the population served by CAPSi.<sup>5,15</sup> In an examination of seven CAPSi in four Brazilian states during 2003, the frequency of behavioral and emotional disorders that usually affect children and adolescents was 44.5%. Boys used the service more than girls. That study also highlighted the need for investment in staff training, network expansion, and standardization of records in national databases.<sup>15</sup> More recently, Ceballos et al.<sup>5</sup> also found a high percentage of visits for behavioral and emotional disorders that commonly appear in childhood/adolescence and mental retardation. They also suggested strengthening the Psychosocial Care Network (Rede de Atenção Psicossocial [RAPS]), given the evidence showing that providing mental health care at the primary health care (PHC) level is associated with a reduction in stigma and more engaged patients and families.<sup>5</sup> In addition, the collaboration between specialized child mental health services and PHC would promote shared responsibility for the treatment of users.

The present study aimed to describe the characteristics of CAPSi service use regarding diagnostic categories, sociodemographic aspects, and care modalities between 2008 and 2012.

## Methods

We performed a descriptive, ecological study, using publicly available data from the DataSUS website. Nationwide data regarding high-complexity procedure authorizations (Autorização de Procedimentos de Alta Complexidade [APAC]), which until 2012 recorded all visits made to CAPSi, were retrieved for the period from 2008-2012. CAPSi facilities were used as the unit of analysis according to the regions of Brazil. To collect the data, we accessed the service area in the DataSUS website, selected the option to transfer files, located those referring to the Outpatient Information System with data available in table format, and looked for files named miscellaneous AD-APAC reports.

The following variables were analyzed: sex; age range, divided into four categories: 1-4, 5-9, 10-14, and

15-19 years; and diagnosis (F00-F99 – chapter V of the ICD-10). Diagnoses in the F60-F69 group of personality disorders and adult behaviors were excluded.

To establish the level of care provided, three categories were considered: intensive care (daily attendance); semi-intensive (frequency of up to 12 days a month); and non-intensive (frequency of up to 3 days a month).

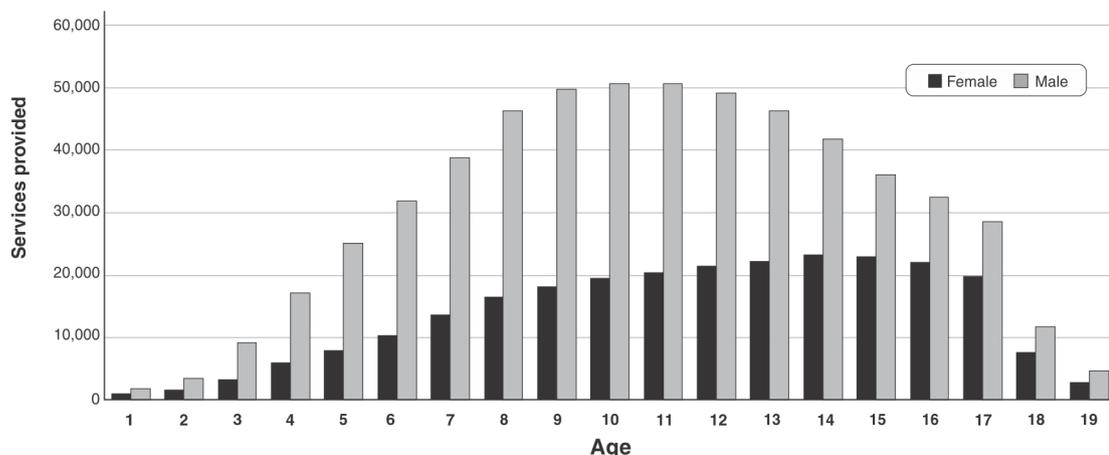
Data were processed using the DataSUS TabWin software (Departamento de Informática do SUS, <http://www2.datasus.gov.br/DATASUS/index.php?area=060805>) and STATA version 12. A descriptive analysis of APAC data according to age and ICD code was performed for each region of Brazil. Approval by an ethics committee was waived due to the public nature of the data.

It should be noted that some variables, such as race/skin color, were not included in the analyses because 52% of the records did not report this variable. In the variables analyzed in this study, there were no missing data.

## Results

A total of 837,068 records were identified for children/adolescents aged  $\leq 19$  years attending CAPSi (2008-2012) across the five regions of Brazil. Most users were male (68.8%), without changes over the period considered. The overall mean age was 11 years (standard deviation [SD] 3.9). With respect to the use of the service by sex, the mean age at onset of service use was 11 years for boys and 12 for girls. Among girls, there was an increase in the number of consultations with age (except in the 18 to 19 age category) (Figure 1).

Analysis of sex distribution by age shows that the highest percentage of use (about 40%) occurred between the ages of 10 and 14 and was similar for boys and girls. However, sex differences were observed in other age groups. In the group aged 5-9 years, boys accounted for 33.3% of visits, vs. 25.5% for girls. In the age group between 15-19 years, girls represented 28.9% and boys 19.7%. For girls and boys up to 4 years of age, the percentages were 4.6 and 5.5%, respectively.



**Figure 1** Number of consultations in Centro de Atenção Psicossocial Infanto-Juvenil (CAPSi) by age and sex, Brazil 2008-2012.

### *Nosologic profile*

Of the available records, 85.7% were concentrated in five diagnostic groups: 29.7% for behavioral/emotional disorders, typically appearing during infancy/adolescence (F90-F98); 23.6% for disorders of psychological development (F80-F89); 12.5% for mental retardation (F70-F79); 10.4% for neurotic disorders related to stress and somatoform disorders (F40-F48); and 9.5% for mood disorders (affective) (F30-F39) (Table 1). Five other diagnostic groups had lower frequencies: schizophrenia, schizotypal, and delusional disorders (F20-F29, 6.1%); unspecified mental disorders (F99, 5.4%); mental/behavioral disorders due to psychoactive substance use (F10-F19, 1.8%), behavioral syndromes associated with physiological disturbances and physical factors (F50-F59, 0.9%); and organic mental disorders, including symptomatic ones (F00-F09, < 0.1%). Given the low levels of attendance associated with the latter five nosologic groups, we chose to examine in detail only the first five most frequent diagnostic groups.

As shown in Table 1, 55.6% of the CAPSi visits in the Midwest were attributed to the F90-F98 diagnostic group, while in the Southeast, Northeast and South the highest percentages were in the F80-F89 group. Mental retardation was the second most common group of disorders among CAPSi users in the North and Northeast. A high percentage of F40-F48 group diagnoses was observed in the North and South. Mood (affective) disorders (F30-F39) were the fifth more prevalent reason for CAPSi visits in Brazil and accounted for 16.6% of CAPSi visits in the South – much higher than in Brazil or in the other regions (Table 1).

When examining the distribution of specific diagnoses within these five groups considering Brazil as a whole, it was found that among all CAPSi visits, the 10 most frequent diagnoses were F90 – hyperkinetic disorders (13%), F84 – global development disorders (12.4%), F91 – conduct disorders (8.4%), F89 – unspecified disorders of psychological development (5.4%), F93 – emotional disorders with onset specific to childhood (5.3%), F32 – depressive episodes (5.2%), F88 – other disorders of psychological development (5%), F70 – mild mental retardation (5%), F41 – other anxiety disorders (4.5%), and F71 – moderate mental retardation.

Regarding the distribution of specific diagnoses according to Brazilian region, group 1 (F90-F98) of hyperkinetic disorders was the most frequent in all regions, ranging from 37.6% in the Southeast to 80.8% in the Midwest. In group 2 (F80-F89), developmental disorders stood out (currently defined as autistic spectrum disorders [ASD]), with 61.1% in the Southeast, surpassing the national average of 52.3%. Specific developmental disorders of scholastic skills stood out only in the North, with 30.9% of visits. Among the visits classified in group 3 (F70-F79), the diagnosis of mild mental retardation was more than 40% in all regions, except in the Northeast (31.4%), where moderate mental retardation was more frequent (41.8%). In the fourth group (F40-F48), the percentage of visits due to diagnoses other than anxiety disorders was higher than 43% except in the Southeast (33%),

where reactions to severe stress/adaptation disorders stood out at 34.7%. Finally, in group 5 (F30-F39), the diagnosis of depressive episodes predominated in all regions, ranging from 50% in the South to 73.3% in the North, followed by bipolar affective disorder with frequencies ranging from 14.7% in the North to 42.9% in the Midwest. The frequency of unspecified mood disorders (affective) was high in the Southeast (12.6%) and South (18.2%) (Table 2).

When examining diagnostic distribution according to age group, it was found that, in the F90-F98 group, hyperkinetic disorders were the most common in all ages except for the 15-19 age group, in which behavioral disorders were the most frequent, accounting for 46.4% of the visits. In the F80-F89 group, ASD was the most common condition in all age groups, ranging from 40.2% in the 10-14 year age group to 60.1% among children aged 1-4 years. Regarding F70-F79 diagnoses, mild mental retardation predominated in the 1-14 year age group, whereas moderate retardation was the most frequent diagnosis in the 15-19 year group, with 39.6%. For F40-F49 disorders, the most frequent diagnoses were reactions to severe stress/adaptation disorders: 48.5% between the ages of 1-4 years, and 41.4% between the ages of 5-9 years. For adolescents, the diagnoses of other anxiety disorders were predominant, with 44.7% for those aged 10-14 years, and 48.6% for the 15-19 year group. Finally, in the F30-F39 group, depressive episodes were the most frequent in all age groups, ranging from 45.5% among children aged 1-4 to 57.3% in 5-9 year old children (Table 3).

In the F90-F98 group, hyperkinetic disorders were found to be the most frequent in both sexes; there were important differences in emotional disorders with onset in childhood, with higher frequencies in females than males (27 vs. 14.9%). In the F80-F89 group, ASD was the most frequent for both sexes, with a higher percentage among males (51.2 vs. 38.6%). Depressive episodes were more frequent in girls than in boys (56.8 vs. 52.1%) (Table 3).

### *Services provided by CAPSi*

With respect to the frequency of the treatments, the most frequent type of care was semi-intensive care, ranging from 42.4% for mental retardation to 55.6% for behavioral disorders. Intensive treatment was the least frequent in Brazil, ranging from 0.6% for behavioral/emotional disorders that usually appear in childhood/adolescence (F90-F98) to 16% for mental retardation disability, except in the North, where intensive care was very frequent. Unlike other regions, in the North intensive care was very frequent, especially in the F70-F79 (38.2%), F40-F49 (51.8%), and F30-F39 (52.9%) groups (Table 4).

In behavioral/emotional disorders (F90-F98), semi-intensive care was predominant in all regions, surpassing 50% in this nosologic group. For the F80-F89 group, the most frequent type of care was semi-intensive, except in the North, where non-intensive care was more common. Intensive care for the mental retardation group predominated in the North (38.2%), and was also frequent

**Table 1** Diagnoses of children and adolescents treated in Child and Adolescent Psychosocial Care Centers (Centro de Atenção Psicossocial Infanto-Juvenil [CAPSI]) according to region, Brazil 2008-2012

ICD-10 code and diagnosis	North	Northeast	Midwest	Southeast	South	Brazil
F90-F98: Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	2,835 (34)	69,602 (29.3)	21,877 (55.6)	92,215 (26.3)	62,273 (30.8)	248,802 (29.7)
F80-F89: Disorders of psychological development	700 (8.4)	50,300 (21.2)	3,900 (9.9)	105,627 (30.2)	37,192 (18.4)	197,719 (23.6)
F70-F79: Mental retardation	1,627 (19.5)	54,549 (23.0)	3,160 (8.1)	33,355 (9.5)	11,979 (5.9)	104,670 (12.5)
F40-F48: Neurotic, stress-related, and somatoform disorders	1,113 (13.6)	21,006 (8.8)	3,705 (9.4)	31,638 (9.0)	29,789 (14.8)	87,251 (10.4)
F30-F39: Mood (affective) disorders	1,021 (12.2)	10,290 (4.3)	4,617 (11.7)	30,178 (8.6)	33,426 (16.6)	79,532 (9.5)
F20-F29: Schizophrenia, schizotypal, and delusional disorders	375 (4.5)	14,548 (6.1)	1,115 (2.8)	26,210 (7.5)	9,099 (4.5)	51,347 (6.1)
F99: Unspecified mental disorder	525 (6.3)	10,038 (4.2)	747 (1.9)	23,221 (6.6)	10,247 (5.1)	44,778 (5.4)
F10-F19: Mental and behavioral disorders due to psychoactive substance use	33 (0.4)	2,587 (1.1)	129 (0.3)	5,972 (1.7)	6,576 (3.3)	15,297 (1.8)
F50-F59: Behavioral syndromes associated with physiological disturbances and physical factors	100 (1.2)	4,420 (1.9)	68 (0.2)	1,538 (0.4)	1,288 (0.6)	7,414 (0.9)
F00-F09: Organic mental disorders, including symptomatic, mental disorders;						
F10-F19: Mental and behavioral disorders due to psychoactive substance use	10 (0.1)	158 (0.1)	39 (0.1)	41 (0.1)	10 (0.0)	258 (0.0)
Total	8,339 (100.0)	237,586 (100.0)	39,357 (100.0)	350,055 (100.0)	201,922 (100.0)	837,068 (100.0)

Data presented as n (%).

**Table 2** Percentage of visits to Child and Adolescent Psychosocial Care Centers (Centro de Atenção Psicossocial Infanto-Juvenil [CAPSi]) according to diagnoses and regions of Brazil, 2008-2012

ICD-10 code and diagnosis	North	Northeast	Central-West	Southeast	South	Brazil
<b>F90-F98</b>						
F90 - Hyperkinetic disorders	78.5	41.5	80.8	37.6	41.2	43.8
F91 - Conduct disorders	13.2	29.8	10.9	29.4	32.2	28.4
F93 - Emotional disorders with onset specific to childhood	1.4	20.0	4.2	20.3	16.9	17.7
F92 - Mixed disorders of conduct and emotions	0.0	2.8	0.9	5.3	1.8	3.3
F94 - Disorders of social functioning with onset specific to childhood and adolescence	2.1	2.5	0.5	3.5	3.6	3.0
F98 - Other behavioral and emotional disorders with onset usually occurring in childhood and adolescence	3.4	2.7	2.5	3.2	3.2	3.0
F95 - Tic disorders	1.4	0.8	0.3	0.8	1.0	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>F80-F89</b>						
F84 - Pervasive developmental disorders	27.7	50.2	51.4	61.1	30.7	52.3
F88 - Other disorders of psychological development	3.1	12.8	16.2	24.5	23.2	21.0
F89 - Unspecified disorder of psychological development	33.4	12.4	7.6	8.9	31.4	14.1
F81 - Specific developmental disorders of scholastic skills	30.9	11.6	12.3	2.2	4.8	5.4
F83 - Mixed specific developmental disorders	0.0	8.4	2.1	2.4	7.8	4.9
F80 - Specific developmental disorders of speech and language	4.9	4.4	10.5	0.7	2.1	2.1
F82 - Specific developmental disorder of motor function	0.0	0.2	0.0	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>F70-F79</b>						
F70 - Mild mental retardation	51.2	31.4	62.2	50.7	42.6	40.1
F71 - Moderate mental retardation	13.4	41.8	12.0	28.9	37.9	35.9
F79 - Unspecified mental retardation	32.6	13.4	24.0	11.3	10.5	13.0
F72 - Severe mental retardation	2.8	12.9	1.7	9.0	7.2	10.5
F78 - Other mental retardation	0.0	0.4	0.2	0.1	1.8	0.5
F73 - Profound mental retardation	0.0	0.1	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>F40-F48</b>						
F41 - Other anxiety disorders	53.5	54.1	55.4	33.0	45.5	43.6
F43 - Reaction to severe stress and adjustment disorders	24.0	17.0	21.2	34.7	34.6	29.7
F40 - Phobic anxiety disorders	16.4	9.0	9.4	9.5	10.6	9.9
F42 - Obsessive-compulsive disorder	3.6	10.2	11.4	10.8	6.2	9.0
F48 - Other neurotic disorders	0.3	5.1	0.1	6.2	0.4	3.6
F44 - Dissociative (conversion) disorders	2.2	2.1	2.4	4.2	1.0	2.5
F45 - Somatoform disorders	0.1	2.6	0.2	1.5	1.6	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
<b>F30-F39</b>						
F32 - Depressive episode	73.3	51.9	53.1	59.6	50.0	54.4
F31 - Bipolar affective disorder	14.7	19.5	42.9	20.5	23.0	22.7
F39 - Unspecified mood (affective) disorder	3.9	8.8	0.1	12.6	18.2	13.6
F33 - Recurrent depressive disorder	3.5	11.9	1.6	4.1	3.0	4.5
F30 - Manic episode	4.6	3.1	0.9	0.8	2.0	1.7
F34 - Persistent mood (affective) disorders	0.0	2.1	0.7	2.0	1.4	1.7
F38 - Other mood (affective) disorders	0.0	2.7	0.6	0.5	2.3	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

F30-F39 = mood (affective) disorders; F40-F48 = neurotic, stress-related, and somatoform disorders; F70-F79 = mental retardation; F80-F89 = disorders of psychological development; F90-F98 = behavioral and emotional disorders with onset usually occurring in childhood and adolescence.

in the Midwest (20.9%) and South (16.3%). Semi-intensive care predominated in the Northeast and Southeast, while in the South and Midwest non-intensive care was most frequent (Table 4).

In the F40-F49 group, intensive care predominated in the North, vs. semi-intensive in the Northeast, Southeast and Midwest, and non-intensive in the South. In the group of mood disorders (F30-F39), intensive care was only evident in the North (52.9%). In the Northeast, Southeast and South, the most frequent type of care was semi-intensive; and non-intensive in the Midwest (Table 4).

## Discussion

The significant number of APAC records reviewed (837,068) provided a detailed picture of the nosologic pattern associated with visits to CAPSi between 2008 and 2012, and its distribution by sex, age, and Brazilian region.

The predominance of males in child/adolescent care (68.8%) has also been reported by other national studies on CAPSi users<sup>16-20</sup> and by studies on other types of services aimed at the mental health care of individuals in this age group.<sup>21-23</sup> In the literature, the proportion of males in mental health services ranges from 59.7%<sup>21</sup>

**Table 3** Distribution of diagnoses associated with visits to Child and Adolescent Psychosocial Care Centers (Centro de Atenção Psicossocial Infanto-Juvenil [CAPSII]) in Brazil according to age and sex, 2008-2012

ICD-10 code and diagnosis	Age group (years)				Sex	
	1-4	5-9	10-14	15-19	Male	Female
F90-F98: Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	12,489	100,854	110,641	24,818	190,014	58,788
F90 - Hyperkinetic disorders	5,101 (40.8)	51,031 (50.6)	45,980 (41.6)	6,984 (28.1)	90,471 (47.6)	18,625 (31.7)
F91 - Conduct disorders	1,897 (15.2)	20,437 (20.3)	36,763 (33.2)	11,520 (46.4)	54,301 (28.6)	16,316 (27.8)
F92 - Mixed disorders of conduct and emotions	194 (1.6)	2,521 (2.5)	4,106 (3.7)	1,270 (5.1)	5,852 (3.1)	2,239 (3.8)
F93 - Emotional disorders with onset specific to childhood	3,991 (32.0)	20,158 (20.0)	17,001 (15.4)	2,992 (12.1)	28,288 (14.9)	15,854 (27.0)
F94 - Disorders of social functioning with onset specific to childhood and adolescence	670 (5.4)	3,007 (3.0)	2,784 (2.5)	920 (3.7)	4,903 (2.6)	2,478 (4.2)
F95 - Tic disorders	49 (0.4)	466 (0.5)	1,129 (1.0)	333 (1.3)	1,484 (0.8)	493 (0.8)
F98 - Other behavioral and emotional disorders with onset usually occurring in childhood and adolescence	587 (4.7)	3,234 (3.2)	2,878 (2.6)	799 (3.2)	4,715 (2.5)	2,783 (4.7)
F80-F89: Disorders of psychological development	20,266	81,422	81,138	32,344	161,962	53,208
F80 - Specific developmental disorders of speech and language	795 (3.9)	1,984 (2.4)	1,109 (1.4)	281 (0.9)	2,904 (1.8)	1,265 (2.4)
F81 - Specific developmental disorders of scholastic skills	146 (0.7)	4,108 (5.0)	5,319 (6.6)	900 (2.8)	7,183 (4.4)	3,290 (6.2)
F82 - Specific developmental disorder of motor function	53 (0.3)	88 (0.1)	55 (0.1)	26 (0.1)	186 (0.1)	36 (0.1)
F83 - Mixed specific developmental disorders	1,941 (9.6)	4,298 (5.3)	3,053 (3.8)	471 (1.5)	7,122 (4.4)	2,641 (5.0)
F84 - Pervasive developmental disorders	12,184 (60.1)	39,724 (48.8)	32,642 (40.2)	18,910 (58.5)	82,943 (51.2)	20,517 (38.6)
F88 - Other disorders of psychological development	2,621 (12.9)	17,258 (21.2)	17,494 (21.6)	4,186 (12.9)	28,468 (17.6)	13,091 (24.6)
F89 - Unspecified disorder of psychological development	2,526 (12.5)	13,962 (17.1)	21,466 (26.5)	7,570 (23.4)	33,156 (20.5)	12,368 (23.2)
F70-F79: Mental retardation	3,001	24,928	46,222	30,519	70,616	34,054
F70 - Mild mental retardation	1,237 (41.2)	10,926 (43.8)	19,018 (41.1)	10,757 (35.2)	28,366 (40.2)	13,572 (39.9)
F71 - Moderate mental retardation	880 (29.3)	8,078 (32.4)	16,512 (35.7)	12,089 (39.6)	25,287 (36.0)	12,272 (36.0)
F72 - Severe mental retardation	429 (14.3)	1,851 (7.4)	4,595 (9.9)	4,155 (13.6)	7,405 (10.5)	3,625 (10.6)
F73 - Profound mental retardation	0 (0.0)	22 (0.1)	18 (0.0)	11 (0.0)	35 (0.0)	16 (0.0)
F78 - Other mental retardation	36 (1.2)	110 (0.4)	228 (0.5)	104 (0.3)	305 (0.4)	173 (0.5)
F79 - Unspecified mental retardation	419 (14.0)	3,941 (15.8)	5,851 (12.7)	3,403 (11.2)	9,218 (13.1)	4,396 (12.9)
F40-F48: Neurotic, stress-related, and somatoform disorders	2,482	22,476	39,664	22,629	47,447	39,066
F40 - Phobic anxiety disorders	262 (10.6)	2,377 (10.6)	3,921 (9.9)	2,040 (9.0)	4,878 (10.3)	3,722 (9.5)
F41 - Other anxiety disorders	780 (31.4)	8,510 (37.9)	17,724 (44.7)	10,988 (48.6)	20,289 (42.8)	17,713 (45.3)
F42 - Obsessive-compulsive disorder	53 (2.1)	1,136 (5.1)	3,581 (9.0)	3,093 (13.7)	4,857 (10.2)	3,006 (7.7)
F43 - Reaction to severe stress, and adjustment disorders	1,204 (48.5)	9,305 (41.4)	11,442 (28.8)	3,964 (17.5)	14,321 (30.2)	11,594 (29.7)
F44 - Dissociative (conversion) disorders	48 (1.9)	207 (0.9)	907 (2.3)	1,031 (4.6)	566 (1.2)	1,627 (4.2)
F45 - Somatoform disorders	17 (0.7)	327 (1.5)	642 (1.6)	536 (2.4)	714 (1.5)	808 (2.1)
F48 - Other neurotic disorders	118 (4.8)	614 (2.7)	1,447 (3.6)	977 (4.3)	1,822 (3.8)	1,334 (3.4)
F30-F39: Mood (affective) disorders	783	12,072	36,369	30,250	40,408	39,066
F30 - Manic episode	13 (1.7)	216 (1.8)	610 (1.7)	486 (1.6)	674 (1.7)	651 (1.7)
F31 - Bipolar affective disorder	202 (25.8)	2,712 (22.5)	7,864 (21.6)	7,244 (23.9)	10,067 (24.9)	7,955 (20.4)
F32 - Depressive episode	356 (45.5)	6,915 (57.3)	20,131 (55.4)	15,850 (52.4)	21,051 (52.1)	22,201 (56.8)
F33 - Recurrent depressive disorder	23 (2.9)	289 (2.4)	1,430 (3.9)	1,824 (6.0)	1,459 (3.6)	2,107 (5.4)
F34 - Persistent mood (affective) disorders	30 (3.8)	202 (1.7)	601 (1.7)	437 (1.4)	729 (1.8)	541 (1.4)
F38 - Other mood (affective) disorders	38 (4.9)	332 (2.8)	553 (1.5)	285 (0.9)	729 (1.8)	479 (1.2)
F39 - Unspecified mood (affective) disorder	121 (15.5)	1,406 (11.6)	5,180 (14.2)	4,124 (13.6)	5,699 (14.1)	5,132 (13.1)
Total	39,021	241,752	314,034	140,560	510,447	224,182

Data presented as n (%).

**Table 4** Type of service provided by Child and Adolescent Psychosocial Care Centers (Centro de Atenção Psicossocial Infanto-Juvenil [CAPSij]) according to diagnostic groups and Brazilian regions\*

Services provided	Northern	Northeast	Central-West	Southeast	South	Brazil
<b>Behavioral and emotional disorders with onset usually occurring in childhood and adolescence</b>						
Intensive care	3 (0.1)	568 (0.8)	125 (0.6)	350 (0.4)	386 (0.6)	1,432 (0.6)
Semi-intensive care	1,893 (66.8)	44,333 (63.9)	11,242 (51.4)	48,260 (52.4)	32,447 (52.1)	138,175 (55.6)
Non-intensive care	939 (33.1)	24,469 (35.3)	10,510 (48.0)	43,494 (47.2)	29,440 (47.3)	108,852 (43.8)
Total	2,835 (100.0)	69,370 (100.0)	21,877 (100.0)	92,104 (100.0)	62,273 (100.0)	248,459 (100.0)
<b>Disorders of psychological development</b>						
Intensive care	259 (37.0)	6,001 (11.9)	341 (8.7)	14,831 (14.0)	4,770 (12.8)	26,202 (13.3)
Semi-intensive care	60 (8.6)	29,725 (59.1)	2,106 (54.0)	55,328 (52.4)	18,519 (49.8)	105,738 (53.5)
Non-intensive care	381 (54.4)	14,568 (29.0)	1,453 (37.3)	35,459 (33.6)	13,903 (37.4)	65,764 (33.3)
Total	700 (100.0)	50,294 (100.0)	3,900 (100.0)	105,618 (100.0)	37,192 (100.0)	197,704 (100.0)
<b>Mental retardation</b>						
Intensive care	622 (38.2)	10,635 (19.5)	662 (20.9)	2,808 (8.4)	1,947 (16.3)	16,674 (16.0)
Semi-intensive care	416 (25.6)	22,733 (41.8)	1,250 (39.6)	15,415 (46.2)	4,491 (37.5)	44,305 (42.4)
Non-intensive care	589 (36.2)	21,047 (38.7)	1,248 (39.5)	15,129 (45.4)	5,541 (46.3)	43,554 (41.7)
Total	1,627 (100.0)	54,415 (100.0)	3,160 (100.0)	33,352 (100.0)	11,979 (100.0)	104,533 (100.0)
<b>Neurotic, stress-related, and somatoform disorders</b>						
Intensive care	576 (51.8)	3,913 (18.9)	151 (4.1)	2,704 (8.6)	4,375 (14.7)	11,719 (13.5)
Semi-intensive care	349 (31.4)	9,101 (43.9)	2,051 (55.4)	16,826 (53.2)	12,256 (41.1)	40,583 (46.7)
Non-intensive care	188 (16.9)	7,707 (37.2)	1,503 (40.6)	12,084 (38.2)	13,158 (44.2)	34,640 (39.8)
Total	1,113 (100.0)	20,721 (100.0)	3,705 (100.0)	31,614 (100.0)	29,789 (100.0)	86,942 (100.0)
<b>Mood (affective) disorders</b>						
Intensive care	540 (52.9)	1,933 (18.9)	244 (5.3)	2,480 (8.2)	5,083 (15.2)	10,280 (12.9)
Semi-intensive care	278 (27.2)	5,119 (50.1)	1,655 (35.8)	16,751 (55.5)	15,423 (46.1)	39,226 (49.4)
Non-intensive care	203 (19.9)	3,158 (30.9)	2,718 (58.9)	10,941 (36.3)	12,920 (38.7)	29,940 (37.7)
Total	1,021 (100.0)	10,210 (100.0)	4,617 (100.0)	30,172 (100.0)	33,426 (100.0)	79,446 (100.0)

Data presented as n (%).

\* Intensive care = daily care for people in severe psychic suffering; semi-intensive care = up to 12 monthly visits; non-intensive care = up to 3 monthly visits.

to 69.7%.<sup>18</sup> There may be a number of reasons for this, including a higher prevalence of some types of mental disorders in boys, particularly hyperkinetic disorders, conduct disorders (F90-98), and ASD (F80-89).<sup>24-27</sup> According to Goodman,<sup>24</sup> there are no marked differences between the sexes in the prevalence of mental disorders, although boys are more likely to have a mental health problem before puberty. After that period, the opposite is true. It is known that boys have a higher proportion of hyperkinetic disorders, ASD, and conduct disorders, with the first two having an early onset, whereas among girls, anxiety and depressive disorders predominate, with later onset.<sup>24,25,28</sup> Our findings are in agreement with this observation, since girls started using CAPSi services when they were slightly older.

Reis et al.<sup>14</sup> have hypothesized that there may be a differentiated recognition of mental disorders in boys and girls, with the problems of boys being more easily identified and appreciated by the family and the school. This could lead to boys seeking care more frequently. This hypothesis has been confirmed in review studies,<sup>28</sup> as well as in research on the use of mental health services among Brazilian children/adolescents.<sup>4</sup>

The mean age of the Brazilian population served by CAPSi was 11 years, similar to other national studies reporting a mean age between 9.4 and 11.7 years.<sup>16,19</sup> The profile identified for CAPSi visits seems to be in line with data from community mental health services in other countries. An Argentinian study identified a median age of 13 years.<sup>29</sup> In Paris, a study of two mental health services for young people found that 71% of those treated were boys, and that most were in the 6-11 year age group (64.7%).<sup>30</sup>

Analyzing the major diagnostic groups of ICD-10 – chapter V, the highest frequency of visits was associated with the F90-F98 group (29.7%). This predominance is to be expected, since this group contains the main diagnoses of mental disorders with early onset, both (F90, F91) externalizing types, and therefore easier to recognize,<sup>4,18</sup> in agreement with the findings in the literature.<sup>2</sup> The F90-F98 group is very heterogeneous, including hyperkinetic disorders (F90) and conduct disorders (F91), which are two of the most common childhood/adolescence disorders, whose prevalence in the general Brazilian population corresponds to 1.8-8.2 and 2.4-7.8%, respectively.<sup>3</sup> In the present study, it was found that both are among the most common diagnoses in CAPSi visitors, accounting for 13% of the total number of children/adolescents with a diagnosis in the F90 group, and 8.4% of those with a diagnosis in the F91 group.

The second most frequent group of CAPSi visitors were those with an F80-89 type diagnosis (23.6%), which also encompasses early-onset disorders, known as psychological developmental disorders. This group includes ASD, which, despite its low prevalence of 0.2-0.9% in the general population,<sup>3,27</sup> is expected to be very frequent in CAPSi, due both to the precocity and chronicity of the symptoms as well as to their severity. ASD is considered one of the most severe child mental disorders. In the present study, this diagnosis accounted for 12.4% of the total number of visits, and within the F80-F89 group,

ASD represented more than half, except in the North and the South. This result suggests that CAPSi have fulfilled their role of assisting children/adolescents with severe and persistent mental disorders.<sup>11</sup>

A study performed in two Paris services reported behavioral problems as the most frequent (21.8%), followed by cognitive difficulties (19.3%) and affective or emotional problems (15.6%). These data are similar to the profile found in our study.<sup>30</sup>

An analysis of the frequency of visits in the F90-F98 and F80-F89 groups showed that four of the five Brazilian regions followed the national trend, while in the Southeast the F80-F89 group was more frequent than the F90-98 group, as identified in a previous study.<sup>13</sup> Possibly, this finding points to the greater inclusion of children with ASD in the CAPSi of this region. The North and Midwest had the lowest frequencies of F80-F89 diagnoses. One possible explanation could be that traditional services, such as philanthropic institutions that have historically cared for this population, continue to support these children/adolescents.<sup>31</sup>

The F70-79 group, which encompasses mental retardation, represented 12.5% of the total number of visits in Brazil, 23% in the Northeast, and 19.5% in the North. Normally, CAPSi would not be the best service for this type of care, except in the presence of important mental comorbidities. This finding may reflect the lack of adequate services to deal with mental retardation, which might prevent the access of other children/adolescents to CAPSi. This is even more relevant considering the fact that these two regions have a lower rate of CAPSi support than the national average.<sup>5</sup>

The F40-48 group accounted for 10.4% of the total number of visits, with slight variations between the regions. However, anxiety disorders represented the highest percentage of the visits, since in the F90-98 group diagnoses of emotional disorders with significant rates are also found (emotional disorders starting specifically in childhood corresponded to 17.7% of the F90-98 group). Within the F40-48 group, non-specific diagnoses (other anxiety disorders) and reactions to severe stress predominated.

The F30-39 group represented 9.5% of the visits in Brazil, with a clear predominance of depressive episodes (54.4%), but also bipolar affective disorder (22.7%) and unspecified mood disorders (13.6%). This provides evidence to the early onset of these disorders in childhood.

Among the less represented nosologic groups, worthy of note are the F20-29 group, with 6.1% of the diagnoses and the highest frequency in the Southeast, and F99, with 5.4%. The first finding is important in relation to the treatment of psychotic conditions, in which early intervention could lead to a better prognosis. The frequency of visits with an F99 diagnosis (unspecified mental disorder) might be reflecting a resistance to making diagnoses in clinical practice; however, diagnostic information is mandatory in the APAC system, and F99 might be used in such cases. Another important finding was the low frequency of diagnoses in the F10-19 group (1.8%), suggesting that, despite the policy guidelines designating CAPSi as the service in charge of the care of children/adolescents with alcohol and other drug problems, this does not always

take place in practice. Although still low, the South had the highest frequency of CAPSi visits due to alcohol and drug problems (3.3%). These low rates are worrisome given the rates of alcohol and illicit substance use among Brazilians: according to the 2015 National Survey of School Health (Pesquisa Nacional de Saúde Escolar [PeNSE]), alcohol consumption among schoolchildren is 23.8% and illicit drug use is 4.2% considering the previous 30 days.<sup>32</sup>

Regarding the type of service provided, we found a clear predominance of semi-intensive care, followed by non-intensive and intensive care. The greatest frequency of intensive care was found in the F70-79 group (mental retardation), which reinforces the hypothesis that there is a lack of adequate services for this population, or else that information on important comorbidities is missing from APAC. It is noteworthy that the highest percentage of intensive care was detected in the North, the region with the lowest number of CAPSi.<sup>5</sup> This paradox needs to be carefully analyzed so that it can be used to target care, particularly in this region of the country. In the treatment of children and adolescents with mental retardation, actions aimed at social inclusion in the community, and schools in particular, should shape therapeutic projects, making attendance at CAPSi less important than social inclusion.

Another hypothesis that might explain the frequency of CAPSi attendance is that children depend on their relatives to be taken to CAPSi, and this may be a limiting factor in relation to transportation costs or caregiver time availability. One final hypothesis is that the insufficient number of CAPSi is affecting the decision to employ less intensive types of care to enable the large existing demand to be met. It is known that CAPSi account for only 9.8% of the total CAPS facilities in Brazil. Also, some Brazilian states do not have even one single CAPSi; and among municipalities with more than 150 thousand inhabitants, only 60.4% have a CAPSi.<sup>5</sup>

It should be emphasized that the coordination of the CAPS in the different regions is vital to provide adequate mental health care for children/adolescents,<sup>33</sup> in particular with respect to strengthening the relationships between PHC and other fields that are necessary for this type of care, such as education, social work, and law. The lack of services or the faulty integration between the services that are available can impact the nosologic profile found in CAPSi, leading to a distortion in demand. Activities such as continuing education and matrix support may contribute to increasing the effectiveness of actions and facilitate the access of children/adolescents and their families to appropriate quality care.

The present study has produced novel insights, but some limitations need to be highlighted, mainly arising from the use of secondary data. The lack of the identification of individual cases in APAC compromises population inferences, because registration according to procedure prevents analysis of the care provided by type, frequency, intensity, and other factors. It is particularly problematic that APAC does record comorbidity data, which would allow characterization of care intensity needed and help improve the understanding of unexpected outcomes, such as those related to mental retardation in the North and Northeast. It is also important to consider

that APAC records were designed for administrative and not clinical purposes, as a management tool, without confirmation of their validity. In addition, APAC records show the proposed treatment, and not necessarily the actual treatment provided.

Finally, it should be mentioned that the manner of recording CAPS visits changed in the beginning of 2013, so that currently no information is available regarding the care intensities reported in this study. However, the present study was still able to compile important five-year data on community mental health services in all Brazilian regions for children and adolescents. This information can be used by managers and policy makers, researchers, and health care professionals to guide decisions about the health care of this population.

## Disclosure

The authors report no conflicts of interest.

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