

Association of child maltreatment and psychiatric diagnosis in Brazilian children and adolescents

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OBJECTIVES: The objective of this study was to evaluate the association between different types of child maltreatment and the presence of psychiatric disorders in highly vulnerable children and adolescents served by a multidisciplinary program.

METHODS: In total, 351 patients with a mean age of 12.47, of whom 68.7% were male and 82.1% lived in shelters, underwent psychiatric evaluations based on the Kiddie-Sads-Present and Lifetime Version. Two different methods were used to evaluate maltreatment: medical records were reviewed to identify previous diagnoses related to socioeconomic and psychosocial circumstances, and the Childhood Trauma Questionnaire was used to obtain a structured history of trauma. Bivariate associations were evaluated between psychiatric disorders and evidence of each type and the frequency of abuse.

RESULTS: The most frequent psychiatric diagnoses were substance use disorders, affective disorders and specific disorders of early childhood, whereas 13.67% of the sample had no psychiatric diagnosis. All patients suffered neglect, and 58.4% experienced physical or sexual abuse. The presence of a history of multiple traumas was only associated with a diagnosis of substance use disorder. Mental retardation showed a strong positive association with reported physical abuse and emotional neglect. However, a negative correlation was found when we analyzed the presence of a history of multiple traumas and mental retardation.

CONCLUSION: All children living in adverse conditions deserve careful assistance, but we found that physical abuse and emotional neglect were most strongly associated with mental retardation and multiple traumas with substance abuse.

KEYWORDS: Child Abuse; Psychiatric Disorders; Shelter; Community Programs; Follow-up Studies.

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■ INTRODUCTION

The World Health Organization defines child maltreatment as any act that promotes real or potential damage to the health, dignity or development of a child (1). Child maltreatment can be classified into five categories: physical abuse, sexual abuse, neglect and negligent treatment, emotional abuse and exploration (1). Global estimates indicate that 1 in 15 people under the age of 18 are victims of maltreatment annually, or approximately 150 million individuals worldwide (2). In Brazil, the statistics on the prevalence of maltreatment in children and adolescents

have not been standardized, making cross-national comparisons difficult.

It is increasingly recognized that child maltreatment is one of the potential antecedents of mental disorders. According to Zavaschia et al (3), 50% of adults with a psychiatric disorder have suffered a form of child maltreatment, whereas others report an increased risk of behavioral disorders among children exposed to physical abuse or domestic violence (4-6).

The occurrence of maltreatment in childhood and adolescence has been reported to be associated with several childhood psychiatric disorders and later adult mood disorders (7), anxiety disorders (8), substance use disorders (9), antisocial behavior (10) and psychoses (11).

It has been hypothesized that exposure to physical or psychological trauma during early childhood development can lead to structural changes in the central nervous system (CNS), which, in turn, yield a greater predisposition for the development of mental disorders during adulthood in genetically susceptible individuals (12). For example, hyperactivity of the hypothalamic axis can result in anatomical changes in the pituitary and adrenal glands and reduced

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hippocampal volume (12). Such changes may impair the capacity to integrate sensory, emotional and cognitive capabilities, resulting in changes in responses to stressful situations (13). These changes may leave a child more vulnerable to future stressful situations. Moreover, the presence of a mental disorder itself may increase the risk of exposure and the degree of vulnerability to stressful situations.

Another important set of determinants of the effects of child maltreatment are environmental factors. The environment, including culture, community integration, domestic violence and other family psychosocial characteristics, may influence the occurrence of maltreatment or, alternatively, may promote resilience and thus shape the future development of behavioral or psychiatric disorders (14,16). For example, the more supportive the family and environment are, the more resilient a child will be and, most likely, the fewer psychiatric and behavioral problems that the child will experience later. Thus, it is important to better understand the association between child maltreatment and behavioral problems or psychiatric disorders in different cultures. In Latin America, and more specifically, in Brazil, few studies have investigated the association between a history of child maltreatment and the presence of mental disorders in adolescence and adulthood.

The evaluation of these possible associations in larger population samples and with a longitudinal follow-up could foster the adoption of stronger public health policies to prevent child abuse and could indirectly prevent the onset of avoidable psychiatric disorders.

The objective of this study was to evaluate the association between different types of child maltreatment and the presence of psychiatric disorders in highly vulnerable children and adolescents served by a multidisciplinary program for formerly homeless or court-referred children in São Paulo, Brazil. This study presents local data from São Paulo in the hope of contributing to the development of clinical approaches and public policies that may successfully address this issue.

■ METHODS

The data presented here were collected between September 2007 and September 2009 from patients evaluated during the first 24 months of the operation of a community-based child mental health program, The Equilibrium Project (TEP), which is designed to address the needs of children and adolescents exposed to extreme psychosocial stressors in São Paulo, SP, Brazil. TEP is an initiative that offers assessment and treatment by a multidisciplinary team staffed by the Department and Institute of Psychiatry of the University of São Paulo, SP, working in partnership with the local municipality (Prefeitura de São Paulo), educational system, social welfare system and Children's Court (including the Guardianship Council and justice system). The development of TEP and its operation have been previously described in greater detail (17).

Group shelter providers, the Children's Court and the Guardianship Council referred patients to TEP. To be eligible for the program, subjects had to be currently living with their families or legal parents or residing in a shelter or foster home.

As part of the standard diagnostic procedures implemented in TEP, all subjects undergo an extensive, 4-week

multidisciplinary assessment, which includes evaluations from a pediatrician, a psychiatrist, a psychologist, a neuropsychologist, an occupational therapist, a physiotherapist, an art therapist, a social worker, an educational therapist and a speech therapist. Whenever possible, family members are invited to attend an interview with a family therapist.

A child and adolescent psychiatrist conducted the psychiatric evaluation through a clinical psychiatric assessment using the Kiddie-Sads-Present and Lifetime Version (K-SADS-PL) (18,19).

Two different methods were used to evaluate maltreatment. First, available medical records were reviewed to identify previous reports reflecting socioeconomic and psychosocial circumstances and diagnostic codes specifically related to family and personal experiences that may influence health status (20). These medical records were obtained from the legal proceedings of the Guardianship Council of São Paulo and the Children's Court.

Second, clinical assessments were complemented with information from current caregivers, the providers of previous services (such as the Children's Court, the Guardianship Council, foster care centers and other healthcare facilities), school reports and criminal justice system records. Thus, the final record of adverse events was based on the information obtained from each of these sources.

In addition, the Childhood Trauma Questionnaire (CTQ) was used to obtain a structured history of trauma from the patients themselves. The CTQ is a 28-item self-report inventory for children over 12 years old. This questionnaire represents a screening tool for identifying exposure to five types of maltreatment: emotional, physical and sexual abuse and emotional or physical neglect. The CTQ also includes a three-item Minimization/Denial scale for identifying suspected false-negative trauma reports (21,22). All instruments used were translated into Portuguese and adapted for the Brazilian population. As our sample includes children under 12 years old, in these cases, a professional TEP staff member administered the questionnaire.

All diagnoses (psychiatric and social) were made following ICD-10 (International Statistical Classification of Diseases and Related Health Problems, 10th edition) diagnostic criteria (20) and were reviewed among the multidisciplinary team until consensus was reached. More detailed information on psychiatric diagnoses in this sample has been reported elsewhere (23).

Statistical analysis

Absolute and relative frequencies of psychiatric disorders and other potential correlates of abuse are presented, including gender, age, a family history of mental disorders, the current place of residence, school attendance and other adverse events.

Bivariate associations were then evaluated between psychiatric disorders and evidence of each of the following: problems related to the alleged sexual abuse of a child by a person within the primary support group (ICD-10, Z61.4) or outside of the primary support group (ICD-10 Z61.5) (20), problems related to the alleged physical abuse of a child (ICD-10 Z61.6) (20), institutional upbringing (ICD-10 Z62.2) (20), the emotional neglect of a child (ICD-10 Z62.4) (20), inadequate family support (ICD-10 Z63.2) (20), a family history of mental disorder (ICD-10 Z81) (20), a child's age,



the number of different types of trauma (amount of trauma) and current place of residence.

To identify the independent association of these variables with psychiatric diagnosis, stepwise logistic regression with backward variable selection was used. All analyses were conducted using SPSS Inc. Released 2005 (SPSS for Windows, Version 14.0, Chicago, IL, USA) with type I error set at 5%.

Ethics

The Institutional Review Board (IRB) of the University of São Paulo (CAPPesq) approved the research protocol. All patients and their legal guardians signed informed consent forms prior to participation in this study.

RESULTS

Table 1 presents the sociodemographic characteristics of the sample and the frequencies of different types of child maltreatment. The sample was composed of 351 children (68.7% male, mean age = 12.47 years). When the children entered the program, 82.1% came from shelters, 15.4% were still living with their families and a small minority (2.3%) were living in the street but were referred to shelters immediately after first contact with TEP. All patients suffered neglect (100%), and 58.4% had documented or reported physical or sexual abuse. We found that 52.47% were subjected to physical abuse, and 18.95% were subjected to sexual abuse. Mental disorder in a family member was evident in 10.2% of the sample. We also found that 44.3% of the sample had received institutional education, i.e., a situation in which children were separated from their parents in early childhood and raised in a group shelter with formal supervision. Among the genders, we observed an average of more adverse events among females (mean 2.01 + standard deviation 1.134) than among males (mean 1.87 + standard deviation 1.038).

Table 1 - Sociodemographic characteristics and adverse situations of children/adolescents with social vulnerability attending a multidisciplinary treatment program (n = 351).

Variables	Frequency
Sociodemographics	
Gender (male)	68.7%
Age (mean ± SD**)	12.47 ± 3.47
Residence at the beginning of treatment	
Group shelter with supervision	82.1%
Family	15.4%
Streets	2.3%
Institution for delinquents	0.3%
Adverse situations	
Neglect	100%
Physical abuse	52.47%
Sexual abuse	18.95%
Institutional education*	44.3%
Family history of mental disorder	10.2%
Adverse situations – Female (mean + SD**)	2.01 + 1.134
Adverse situations – Male (mean + SD**)	1.87 + 1.038

(* Institutional education refers to a situation in which these children were separated from their parents in early childhood and in which the children have been growing up in group shelters with supervision
(**) Standard deviation

The most frequent psychiatric diagnoses were substance use disorders, affective disorders and specific disorders of early childhood. Only 48 children/adolescents (13.67%) in the sample had no psychiatric diagnosis (Table 2).

Correlates of each psychiatric diagnosis in logistic stepwise regression analyses are presented in Table 3.

Table 2 - Psychiatric diagnosis of children/adolescents with social vulnerability attending a multidisciplinary treatment program (n = 351).

Psychiatric Diagnosis*	Frequency n (%)
Substance use disorder	143 (40.7%)
Affective disorder	125 (35.6%)
Specific disorder of early childhood	109 (31.1%)
ADHD**	55 (15.7%)
Conduct disorder	47 (13.4%)
Mental retardation	37 (10.5%)
Anxiety disorder	32 (9.1%)
Pervasive developmental disorder	12 (3.4%)
Impulse disorder	8 (2.33%)
Schizophrenia	7 (2%)
Without psychiatric diagnosis	48 (13.67%)

(* ICD-10 diagnostic criteria (20)
(**) Attention deficit and hyperactivity disorder

Substance use disorder (SUD)

SUD was positively associated with a greater age at the time of program entry (odds ratio [OR] = 1.59) and exposure to multiple traumas, with each new trauma increasing the likelihood of SUD by 34% (OR = 1.34).

Affective disorder (AD)

The occurrence of physical abuse (ICD-10 Z61.6) (20) increased the likelihood of AD by 62% (OR = 1.62).

Specific disorders of early childhood (SDEC)

There were positive associations between SDEC and a history of emotional neglect of a child (ICD-10 Z62.4) (20) (OR = 1.68) and male gender (OR = 1.82).

Attention deficit hyperactivity disorder (ADHD)

ADHD was only associated with being male, which increased the odds of this disorder by 89% (OR = 1.89), but there was no association with any adverse event.

Conduct disorder (CD)

There was a positive association between CD and being male, which doubled the odds (OR = 2.1).

Mental retardation (MR) (20)

The presence of physical abuse (ICD-10 Z61.6) (20) increased the odds of having a diagnosis of MR 3.58 times (OR = 3.58), whereas those children who suffered from emotional neglect (ICD-10 Z62.4) (20) had 5.59 times the likelihood of having a diagnosis of MR (OR = 5.59)

Anxiety disorder (AnD)

Patients who suffered emotional neglect (ICD-10 Z62.4) (20) and those individuals who received their education in an institution (ICD-10 Z62.2) (20) had an 86% reduced likelihood of AnD. In contrast, the presence of a history of



Table 3 - Psychiatric diagnosis* and associated conditions according to logistic regression model**** (odds ratio) (n = 351).**

	SUD n=143	AnD n=32	PDD n=12	SDEC n=109	ADHD n=55	CD n=47	AD n=125	MR n=37	SZ n=7	WPD n=48
Z61.4/Z61.5	0.40	----	----	----	----	----	----	----	----	----
Z61.6	----	2.09	----	----	----	----	1.62	3.58	----	----
Z62.2	----	----	----	----	----	----	----	----	----	----
Z62.4	----	0.16	----	1.68	----	----	----	5.59	----	----
Z63.2	----	2.27	----	----	----	----	----	----	----	----
Z81	----	----	3.9	----	----	----	----	----	----	----
Age	1.59	1.07	0.84	0.91	0.83	----	----	----	----	0.74
NT	1.34	----	----	----	----	----	----	0.47	----	----
LH	----	----	----	----	----	----	----	----	----	----
Gender (male)	----	----	----	1.82	1.89	2.10	----	----	----	0.34

(***) ICD-10 diagnostic criteria (20).

(****) The results presented here refer to the odds ratio at the last step of the algorithm.

Substance use disorder (SUD), anxiety disorder (AnD), pervasive developmental disorder (PDD), specific disorders of early childhood (SDEC), attention deficit and hyperactivity disorder (ADHD), conduct disorder (CD), affective disorder (AD), mental retardation (MR) schizophrenia (SZ); without a psychiatric diagnosis (WPD).

ICD-10 (20): Z61.4 and Z61.5 Sexual abuse, Z61.6 Physical abuse, Z62.2 Education in institution, Z62.4 Emotional neglect, Z63.2 Inadequate family support, Z81 Family history of mental disorder.

Number of traumas (NT), local housing (LH).

physical abuse (ICD-10 Z61.6) (20) and inadequate family support (ICD-10 Z63.2) (20) slightly increased the odds of AnD by 2% (OR = 2.025) and 2.22% (OR = 2.22), respectively.

Pervasive developmental disorder (PDD)

A family history of mental disorder (ICD-10 Z81) (20) increased the odds of PDD by 3.9 times, whereas age was negatively associated with PDD, such that for each year, the chance of PDD was reduced by 16% (OR = 0.84).

Schizophrenia (SZ) and impulse disorder (ID)

There were no associations between psychosocial circumstances and the diagnosis of either SZ or ID.

Children without a psychiatric diagnosis (WPD)

The children/adolescents who were not diagnosed with any psychiatric disorder were negatively associated with age and male gender. The chance of the absence of any psychiatric diagnosis was reduced by 26% (OR = 0.74) for each additional year of age. There was also a negative association between male gender and the presence of a psychiatric diagnosis. In this population, being male was associated with a 66% reduced likelihood of the chance of receiving a psychiatric diagnosis (OR = 0.34).

DISCUSSION

This study examined the relationship between psychiatric diagnosis and four types of child maltreatment, a family history of mental disorders and sheltering among children and adolescents treated in an interdisciplinary community-based treatment program in São Paulo, Brazil. Significant associations were observed between diagnosis, several sociodemographic characteristics and specific types of child maltreatment.

Male gender was associated with diagnoses of ADHD, CD, SDEC and PDD. The literature notes contradictions related to gender and association with specific types of mental disorders. In several studies, male children exposed to domestic violence were found to have a greater predisposition to both externalizing and internalizing

symptoms of mental disorder (25), whereas other reports noted that female children were more affected (26). Nevertheless, in our study, boys had a lower risk of having any psychiatric disorder than girls did. This finding could reflect the higher prevalence of adverse events among girls than boys, although the result was not statistically significant (OR = 0.30). However, a greater number of resilience factors are associated with female gender, including "cognitive skills", "adaptable personality" and "self-esteem" (27). The lower prevalence of psychiatric disorders among boys may also be related to the lack of homogeneity within gender or differences in the proportions of adverse events between genders in our sample.

In a recent study, Moylan (28) concluded that girls were more likely to internalize symptoms, whereas boys were more likely to externalize symptoms. Our study indicates both externalization among males (in association with ADHD and CD) and internalization (in association with SDEC). The associations between males and PDD and ADHD are already well established in the literature (25).

We observed negative associations between age and the disorders AD, PDD, SDEC, ADHD and WPD. That is, the younger the child was, the greater the probability of not having any psychiatric diagnosis or, when a diagnosis was present, the greater the likelihood of having one of these specific diagnoses. This finding was expected for PDD, ADHD and SDEC, in which symptoms typically appear earlier in childhood. The same age relationship was noted for the group without psychiatric disorder; the younger the child was, the lower the chance of being diagnosed with any psychiatric disorder. This finding could be explained by a shorter duration of exposure to abuse resulting in a lower risk of disorder. Additional research is needed to confirm this finding.

The presence of a history of multiple traumas was incrementally associated only with a diagnosis of SUD. Others have observed that experiences of multiple episodes or types of abuse or chronic exposure to abuse were generally associated with higher incidences of adverse effects on mental health (29). In studies evaluating the physical health of children, the occurrence of four or more



experiences of abuse has been found to triple the likelihood of poor physical health (29). Thus, we would have expected a stronger association between multiple traumas and psychiatric disorders other than substance abuse. However, the occurrence of multiple abuse exposures in the sample may have muted this finding. In addition, the direction of causality may be bidirectional in substance abuse, with abuse leading to substance abuse and substance abuse leading to further abuse.

The presence of physical abuse (ICD-10 Z61.6) (20) was positively associated with AnD (2.09%) and AD (62%). Inadequate family support (ICD-10 Z63.2) (20) and emotional neglect (ICD-10 Z62.4) (20) were each positively associated with AnD (2.35%) and SDEC (32%). Several authors have previously hypothesized that children who suffer maltreatment would have a greater risk of AnD. This association could be related to cognitive changes generated by the occurrence of maltreatment. Thus, there would be increased apprehension in the perception of external events, increasing vulnerability to the development of AnD (30-32). In the case of inadequate family support, children may feel chronically insecure and anxious, even though we noted a reduction in the likelihood of AnD in our sample. Certain sample characteristics may explain this finding. In many cases, children came from large families that no longer gave much attention to their children, and as a result, the children experienced chronic neglect. During this period of extended neglect, the children may have developed defense mechanisms that reduced their level of anxiety. This concept also deserves investigation in future studies. Children who received their education in an institution had a reduced likelihood of AnD, perhaps because of the protection provided in these institutions and the consequent removal of the source of anxiety or fear.

Other notable findings are related to the diagnosis of MR. We found strong positive associations with reported physical abuse (ICD-10 Z61.6) (20) (OR=3.58) and emotional neglect (ICD-10 Z62.4) (20) (OR=5.59). However, a negative correlation was found when we analyzed the presence of a history of multiple traumas (OR=0.47).

The association between maltreatment and the presence of physical or mental disability in the literature is slightly inconsistent. This inconsistency reflects differences in the samples evaluated and the lack of assessment of the presence of these deficiencies. Many studies focus on studying how family psychosocial factors may trigger an increased risk of maltreatment. It is known that the care of children with disabilities in itself may provoke high levels of family stress (33). The present study identified higher associations of MR with only physical abuse and neglect. Similarly, a study published by the National Center for Child Abuse and Neglect in 1993 and conducted in the USA indicated that children with physical or mental disabilities were 1.7 times more likely to have suffered maltreatment compared with those children without disabilities.

Sullivan and Knutson (34) published a review that noted the presence of a positive association between maltreatment and physical or mental disability, but the strength of the associations varied according to the sample examined. For example, there was a greater association when the determination of deficiency was based on a medical analysis or when the samples were obtained from hospitals. Sullivan and Knutson (35) provides relevant information for public health policy and medical practice, noting that children with

disabilities tend to suffer maltreatment at younger ages compared with children without such disabilities. However, the reason for this difference was not identified.

Several studies (36,33) have reported relatively different results. In a longitudinal study performed using children under 5 years old, Warfield concluded that the presence of a diagnosis of MR or cognitive limitation had no association with the occurrence of maltreatment (36). In our study, there was also no association between the presence of MR and the occurrence of multiple forms of maltreatment, but there were strong associations with physical abuse and emotional neglect. In a more recent study, Jaudes and Diamon (33) found a similar result, reporting that the presence of a diagnosis of MR or cognitive impairment at any age was not significantly associated with the occurrence of maltreatment. Most studies tend to evaluate the presence of both physical and mental disabilities. In cases of multiple disabilities in the same child, Benedict et al. (37) demonstrated a reduced risk of physical abuse and neglect. In such cases, the explanation offered was a greater coping capacity or resilience in these families regarding the conditions of their children, i.e., a reduced discrepancy between the family's expectations and the actual capabilities of their children. In contrast, the families of children served by TEP are typically relatively dysfunctional, as reflected by the fact that in many cases, the children are removed from their families. It was thus expected that in this context, we would find a stronger association between the presence of MR (children who need more care and supervision) and the occurrence of physical abuse and emotional neglect.

Limitations

The first limitation concerns the identification of maltreatment in this population. Underreporting is understandably common but does not necessarily invalidate the results, although this issue must be acknowledged (38). We used multiple sources of information to minimize the risk of underreporting.

Most studies have difficulties in determining the exact date of the onset of exposure to trauma. Such information can be important because the earlier the occurrence of trauma is, the more potentially serious are the effects on the CNS, which might increase vulnerability to mental disorders in adulthood (13). Maternal depression and psychoactive substance use during pregnancy may function as the first stressor to which a child is exposed (12). In this study, it was not possible to pinpoint the exact age of maltreatment onset, but the families of all children faced poor housing situations, and many also had family histories of psychiatric problems, suggesting that adverse events had occurred since pregnancy.

This is a cross-sectional study; thus, the suggested cause-and-effect relationships between abuse and its adverse consequences are not conclusive. An association between the two may occur independently due to confounding factors, or one may predispose to the occurrence of the other. Longitudinal studies are needed for more precise causal assessment. In addition, virtually all of the children had both psychiatric disorders and exposure to trauma or neglect, so we lacked a reference group with no psychiatric diagnosis or trauma, which might have yielded more robust contrasts. This study may be best considered as comparing the distinct association between child maltreatment and different psychiatric disorders in a sample in which nearly



all of the children were exposed to trauma and exhibited evidence of a psychiatric disorder.

According to Famularo et al. in 1996 (39), 35% of child victims of maltreatment had a diagnosis of post-traumatic stress disorder (PTSD). This disorder has great variation in symptoms and clinical presentation, with mood fluctuation, anxiety and even psychotic symptoms. PTSD is seldom diagnosed in infancy and may thus be underestimated by professionals who work directly with traumatized children and adolescents (40). The diagnosis of this disorder requires clear and objective information about the people caring for these children over an extended period of time. Thus, PTSD diagnoses were difficult to make in this sample. After a degree of time tracking, it is possible to identify cases of PTSD, but in this cross-sectional research, it was not possible to identify any case, even after the application of the K-SADS-PL.

Difficulties in controlling for other environmental and social factors add ambiguity to the determination of causal relationships (13). Although we know that other traumas (such as robbery, accidents or a history of injuries) could contribute to mental disorders (13,14), it was not possible to identify and control for these events in this study, especially because the children had been exposed to many different types of trauma and generally harsh life conditions. However, this is the first study of the relationship between adverse events in childhood and mental disorders in the population, and future studies may be able to take these other types of events into account.

Even though this is a cross-sectional study, and thus, cause-and-effect relationships are not conclusive, significant associations were observed between psychiatric diagnosis and both sociodemographic characteristics and several specific types of child maltreatment.

Experiences of multiple abuse or chronic exposure to abuse appear to have adverse effects on mental health. However, in our study, exposure to multiple traumas was only associated with a greater risk of SUD.

All children living in adverse conditions deserve careful assistance, but we found that those children with MR are at greatest risk of physical abuse and emotional neglect. We know that in severe mental disorders, a history of childhood trauma can affect illness progression. This study indicates the importance of developing adequate public policies aimed at the prevention of child maltreatment, especially to reduce the risk of subsequent mental disabilities.

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■ AUTHOR CONTRIBUTIONS

Scivoletto S is the coordinator of The Equilibrium Project (TEP) and, together with other professionals at TEP, collected the data and elaborated on the general database of TEP's patients. Scomparini LB selected a subset of TEP's data to be specifically analyzed in this study and performed a literature review on the topic. Santos B performed statistical analyses and played an important role in the interpretation of the results. Rosenheck RA is an external consultant for TEP who supervises TEP's research. Scomparini LB, Scivoletto S and Rosenheck RA prepared the manuscript.

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