Association between psychosocial stressors with emotional and behavioral problems among children of low-income addicted families living in Brazil

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ABSTRACT

Background: Children exposed to substance use in their families are vulnerable to multiple risk factors in their development and at increased risk for emotional and behavioral problems. The aims of the study were as follows 1) estimate the prevalence of emotional and behavioral problems among children aged 6–11 years old, living with addicted family members in a low-income urban community of São Paulo, Southeastern Brazil; 2) evaluate the children's exposure to family psychosocial stressors and substance use; and 3) investigate the factors related to the increased risk of emotional and behavioral problems and substance use.
Methods: A cross-sectional study was conducted among 101 children aged 6–11 years old ($M = 9.16$ years, $SD = 1.61$). The instruments used were a sociodemographic questionnaire, the Child Behavior Checklist (CBCL) and the Psychosocial Stress Factors (PSF).
Results: High prevalence of problems was found for this sample: the CBCL showed 26.7% of clinical scores for Internalizing Problems, 40.6% for Externalizing Problems, and 40.6% for Total Problems. Exposure to family psychosocial stressors was also high, including severe disease (33%), physical aggression (28.9%), death (27.8%), psychiatric hospitalization (16.7%), suicide attempts (15.5%), and suicide (9.3%). Exposure to these family stressors was associated with an increase of two to four times in the prevalence of internalizing and externalizing problems.
Conclusions: Children exposed to substance abusers have more mental health problems than general population, even when compared to peers living in similar low-income areas. This is a group that should be target of a selective preventive intervention.

1. Introduction

Children exposure to parental substance abuse is associated with several negative outcomes including the harmful use of substances by their children, emotional, behavioral, educational, criminal problems, and other social problems (Kumpfer & Johnson, 2007; Schuckit, Smith, Pierson, Trim, & Danko, 2008; Straussner & Fewell, 2018).

Some studies reported that these children present an increased risk for the development of mental health problems. VanDeMark

et al. (2005) studied a sample of 253 children aged 5–10 years old of mothers in treatment for co-occurring alcohol and/or drug abuse, mental health disorders, and histories of violence. Of these children, 39.9% showed internalizing problems, 37.2% externalizing problems and 42.5% total problems on Child Behavior Checklist. Another research found 29% of the children aged 4–17 years old have psychosocial problems according to their parents' Strengths and Difficulties Questionnaire reports (Geschiere, Spijkerman, & Glopper, 2017).

These rates are much higher than those found in a recent metanalyses that included data from 41 studies conducted in 27 countries that showed a 13.4% (CI 95% 11.3–15.9) prevalence of mental disorders among children (Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). In the developing world, where children and adolescents are a major part of the population, the prevalence may be higher (Fleitlich & Goodman, 2002). There are no national surveys in Brazil, and different rates of mental health problems have been reported. Feitosa, Ricou, Rego, and Nunes, (2011) found a 10% rate when studying urban middle-class children and the ones who live in underprivileged rural areas. Paula, Duarte, and Bordin, (2007) identified a 24.6% of mental health problems on the outskirts of São Paulo city. Another study indicated a 35.2% of clinical cases in a school-based sample from Taubaté, a city in the state of São Paulo (Vitolo, Fleitlich-Bilyk, Goodman, & Bordin, 2005). The discrepant rates found on these studies suggest that we are still trying to identify the global impact of child mental health in Brazil. Specifically, there are no national studies about children of addicted families.

A recent literature review on the impact of parental substance use disorders (SUDs) on children showed that parenting styles and familial dysfunction contribute to children's externalizing and internalizing behaviors and the intergenerational transmission of SUDs. Parental SUDs are associated with inconsistent, disengaged or harsh parenting practices on mother–child bonding, and exposure to violence and father's hostility (Straussner & Fewell, 2018). Among risk factors for children living with parental SUDs, one can include parenting deficits, family conflict, less secure attachment patterns and child maltreatment (Solis, Shadur, Burns, & Hussong, 2012).

Additional evidences suggest that living in a slum, with few or no access to mental health services, is another strong risk factor, especially for young children (Lilford et al., 2016). The investigations on the effects of residing in slum areas have demonstrated consistent relationships between the environmental conditions and impacts on childhood development, morbidity, and mortality. The cycle of family poverty predetermines that the children will be malnourished, will have repeated bouts of illness, and lack of even basic education, all of which ensnares the young adult in low paying jobs or no job at all, perpetuating the aforementioned cycle (Ernst, Phillips, & Duncan, 2013).

Furthermore, children living in slums are at high risk of multiple exposures to violence. Fidalgo et al. (2018) found that having experienced any violent childhood event and having low socioeconomic status (SES) were significantly associated with both having internalizing (aOR = 5.46; 2.17–13.74) and externalizing disorder according to the DSM-IV diagnostic criteria (aOR = 4.33; 1.85–10.15). As reported by a review of the literature there are 6 primary domains in which these conditions influence health and survival through childhood; (1) the maternal and neonatal period, (2) nutritional status, (3) mental health and development, (4) frequency of infectious diseases, (5) exposure to and perpetration of violence, and (6) unintended accidents and injuries (Ernst et al., 2013).

A complex interaction between genetic, biological, psychological and environmental risk factors is responsible for the negative impact on the child development. The social and psychological environments have major influences on children's mental health (Halpern & Figueiras, 2004). It is known that the cumulative effect of multiple risk factors is more important in determining the presence of emotional or behavioral problems than the presence of one single stressor, regardless of its magnitude (Halpern & Figueiras, 2004).

This study contributes to understanding the magnitude of the problem of living in low-income community with addicted family members and its impact on children's mental health. The aims of the study were as follows: 1) estimate the prevalence of emotional and behavioral problems among children aged 6–11 years old, living with addicted family members in a low-income urban community of São Paulo, Southeastern Brazil; 2) evaluate the children´s exposure to family psychosocial stressors and children´s substance use; and 3) investigate the factors related to the increased risk of emotional and behavioral problems and substance use.

2. Method

2.1. Study design and setting

This is a cross-sectional study conducted in the district of Jardim Ângela. The district belongs to the sub-municipality of M'Boi Mirim, located in the low-income neighborhood of São Paulo city. M'Boi Mirim has a 62.1 Km² extension, an area larger than most Brazilian municipalities with 563.305 inhabitants, of these 295.434 residents in Jardim Ângela. The Human Development Index is 0.762, compared to 0.805 for the state of São Paulo as a whole. Jardim Ângela is among the districts with the highest proportion of heads of households with income below 3 minimum wages and the lowest proportion of those receiving more than 20 minimum wages. As for the schooling of the head of the family, the levels are among the lowest in the municipality (LabHab, 2003).

The region is situated on the extreme outskirts of the city with alarming rates of social exclusion, economic helplessness and urban violence. Such a scenario takes even more serious proportions because it affects future generations. The population is predominantly of young people: 52.9% are under 24 years old. The Youth Vulnerability Index is 76 points on a scale of 0–100, with scores higher than 65 points for the most vulnerable districts (SEADE, 2000). The precarious economic conditions of the district, and the lack of opportunities to enter the formal labor market, result in an extremely favorable environment for the growth of drug trafficking, which is also an informal job market, especially for young people (LabHab, 2003).

This area comprised the highest alcohol outlet density reported in the medical literature, revealing a proportion of approximately one alcohol selling point per twelve properties (Laranjeira & Hinkly, 2002). It was considered the most violent neighborhood in the world, with a homicide rate of 111.52 cases per 100.000 inhabitants, much higher than the rate for São Paulo city (42.59). The socioeconomic score was 2.02 while in the most favored regions of the city the grade was 7.0, with a homicide rate of 2.65. These rates, when analyzed in descending order, point to an association between lower socioeconomic scores / higher homicide rates and higher scores / lower rates. The study suggests that there would be an important association between socioeconomic conditions and risk of violence, represented by the homicide rate (Akerman & Bousquat, 1999).

Although Jardim Ângela has high levels of social exclusion, such as unemployment and high criminal rates, the region has a strong community mobilization, which has led to the implementation of programs, such as the ones where this research was conducted.

2.2. Participants

Participants were 101 children ages ranged between six and 11 years old (*M* = 9.16 years old, *SD* = 1.61). The inclusion criteria were: the child had (a) to live with at least one addicted family member; (b) to live in Jardim Ângela neighborhood; and (c) to participate voluntarily in the study. Participants were recruited from two services located in Jardim Ângela neighborhood: (1) The Utility Intervention and Support Center for Children of Substance Abusers (CUIDA) - a prevention program focused on children who were living with addicted family members. The program offered mental health assistance, which included psychological, social workers and medical care. Moreover, the program included other activities, such as educational, recreational, musical, sports, and computer training (Figlie, Milagres, & Crowe, 2009); and (2) The Centers for Children and Adolescents (CCAs): a program that aims to care for children and adolescents withdrawn from child labor and/or subjected to other rights violations; returned to the family, after a protective measure of reception; from families who are beneficiaries of income transfer programs; and children in situations of vulnerability and risk. It acts in the scope of the prevention of social risk situations by offering recreational, socio-educational, sports, cultural and recreational activities, which foster the development of children and adolescents, their creative, cognitive and group living skills. In both programs, all activities took place outside the regular school time-period and all children went to school regularly.

2.3. Instruments

2.3.1. CAGE questionnaire (Ewing, 1984)

A screening questionnaire elaborated to assess exposure to alcohol addiction. The Brazilian version was validated by Masur and Monteiro (1983). For this study, it was adapted to measure substance problems as well, following Brown and Rounds (1995) suggestion. In our study, the cut-off point used was at least one affirmative answer. Using the same cut-off point, Castells and Furlanetto (2005) found that CAGE presented good sensitivity (93.8%) and specificity (85.5%) for a Brazilian general hospital ward sample.

2.3.2. ABEP scale (Brazilian Association of Research Companies - Associação Brasileira de Empresas de Pesquisa – ABEP, 2008)

A standardized survey to assess SES which takes into consideration the possession of household goods and the educational level of the householder. According to their score, ABEP respondents can be sorted into subgroups (A1, A2, B1, B2, C, D, E), with A1 being the highest economic stratum and E the lowest.

2.3.3. Child behavior checklist (CBCL)

Developed by Achenbach and Rescorla (2001) to assess emotional and behavioral problems in children aged 6–18 years old. Validated for different cultures (Rescorla et al., 2007), the CBCL ask parents to rate their children's behavior in 118 items grouped in three large scales: Internalizing, Externalizing and Total Problems. The Internalizing Problems scale comprises problems such as anxiety, depression, somatic complaints, and social withdrawal. The Externalizing Problems scale included rule-breaking behavior and aggressive behavior. The Total Problems scale encompasses all items. Scores are classified as normal, borderline or clinical in comparison with a normative sample of children not referred for mental health services.

It shows high sensitivity in comparison with psychiatric assessment: 87% of the clinical cases were identified (Bordin, Mari, & Caeiro, 1995), good acceptance of the factorial structure (RMSEA = .023), and high discriminative capacity (*p* < 0.001) (Rocha et al., 2013). A review article giving detailed information on the development of these forms in the United States and Brazil is available (Bordin et al., 2013).

The cut-off point used in this study was the one indicated by Rocha et al. (2013) as more adequate for Brazilian samples. Cut-off points (T scores) classify children into three categories: clinical (> 63), borderline (> 60 and < 63), and non-clinical (< 60). Borderline and clinical range scores were grouped following Achenbach and Rescorla (2001) instructions to avoid false negatives.

2.3.4. Psychosocial stress factors (PSF)

The PSF was applied to investigate the psychosocial stress situations. The selection of items was based on the criteria established in the International Criteria Diagnosis (ICD-10): psychiatric hospitalization of a family member, severe disease in the family, suicide of a family member, attempted suicide of a family member, problems with the police, death in the family, and physical aggression among family members (WHO, 1997).

2.4. Procedures

2.4.1. Data collection

The study was carried out from August 2010 to December 2011. According to CUIDA database, 791 children and adolescents attended the service. When data collection was conducted, only 174 were aged six to eleven years old, considering the time between participating on CUIDA program and the current prevalence study. Researchers tried to locate all participants by either phone or home visits. A total of 66 (38%) caregivers accepted to participate in the research and completed all forms, 38 (22%) refused to participate, 37 (21%) were not located, nine (5%) had moved to another city and two (1%) reported their children had never attended CUIDA. Besides, 22 (13%) of the children were institutionalized and were not living with their family of origin. Thirty-five children were recruited to another program, from the same region.

The children were screened through the CAGE questionnaire, to identify only the children exposure to addicted family. Data were collected by a trained psychologist who conducted a 60-minute face-to-face interview with the caregiver on the centers where the programs were carried out, or during home visits. Data were provided by the children's mothers or guardians and none of the informants was the addicted family member. When the mother was a substance user, in general the child was accompanied by a family member that usually took care of the child. Considering that data were collected in a program that offered mental health assistance, the results can be affected by this variable.

2.4.2. Data analysis

The variables were described by absolute frequency and percentage. Some variables had missing values; therefore, the data presented in the tables are from those that answered the questions. To estimate the prevalence ratios (PR), the log-binomial regression model was used (Skov, Deddens, Petersen, & Endahl, 1998), since the response was binary. For all comparisons, a significance level of 5% was adopted. All analyzes were performed using SAS 9.2 software.

2.5. Ethical considerations

The study was approved by the Ethical Committee of the University (CEP n.1843/09) and by the Ethical Research Committee of the Municipal Health Department of São Paulo (CAAE n. 05.174/11) and contemplated all ethical guidelines in Resolution No. 196/96 of the National Health Council of the Ministry of Health. All protocols contained an informed consent form properly signed ensuring the anonymity of the participant and confidentiality of information.

3. Results

3.1. Study sample

Descriptive statistics with sociodemographic data and the family stressful situations reported by the caregivers are presented in Table 1.

The sample included 60 males (59.4%) and 41 females (40.6%), aged 6–11 years old (M = 9.16 years, *SD* = 1.61), composed of 52.5% mixed races, 37.6% white and 9.9% black. The majority (68%) belongs to economic class C and 30% to class D. In 46.5% of the cases, the householder was the mother and in 37.6% the father. Of the total, 81.1% declared to have some religion, and 50.5% of the parents were married or living together.

About parents' educational levels, in general, the mothers presented slightly better levels of schooling when compared with the fathers: 3.3% vs. 20.5% of illiterates; 47.8% vs. 52.3% of less than 8 years of schooling; 45.6% vs. 27.3% of 8–11 years of study. Only a minority (3.3%) of mothers reached an insertion in the university, and no father achieved that educational level. All children attended school regularly.

3.2. Prevalence of psychosocial stress factors

Regarding the psychosocial stress factors, 67% were exposed to some important stressor event in the last 12 months. The results showed a high exposure to family psychosocial stressors, such as severe disease (33%), physical aggression (28.9%), death (27.8%), problems with the law (19.6%), hospitalization for psychiatric disorder (16.7%), suicide attempt (15.5%), and suicide (9.3%), as can be seen in Table 1.

3.3. Addicted family member and prevalence of substance use

In relation to the addicted family member, 60.4% of the users are the fathers, 7.9% are mothers, 8.9% have both parents as substance users, 4% have brothers or sisters who are addicted, and 18.8% have other family members, such as grandparents and uncles. The majority of the addicted family members (53.5%) use alcohol, while 46.5% consume illicit drugs (Table 2). Of the illicit substance users, 3% are cocaine users, 7.9% are marijuana users and 35.6% are polyusers. Regarding the use of substances by children, only 3 caregivers reported that their children (3.1%) consume alcoholic beverages and none reported the consumption of tobacco or illicit drugs.

Table 1
Sociodemographic characteristics and exposure to psychosocial stressful situations (N = 101).

Variables	n (%)
Gender	
Male	60 (59.4)
Female	41 (40.6)
Ethnic group	
White	38 (37.6)
Non-white	63 (62.4)
Socioeconomic status	
Class B1	1 (1.0)
Class B2	1 (1.0)
Class C	68 (68.0)
Class D	30 (30.0)
Religion	
Yes	77 (81.1)
No	18 (18.9)
Parents' marital status	
Married or living together	50 (50.5)
Single, divorced, separated	49 (49.5)
Family stressful situations in the last 12 months	
Psychiatric hospitalization	16 (16.7)
Family severe disease	32 (33.0)
Suicide	9 (9.3)
Suicide attempt	15 (15.5)
Police problems	19 (19.6)
Death of a family member	27 (27.8)
Physical aggression between family	28 (28.9)

3.4. Prevalence of emotional and behavioral problems

The results indicated high rates of emotional and behavioral problems. Clinical scores were reached by 26.7% of the participants for Internalizing Problems, 40.6% for Externalizing Problems, and 40.6% for Total Problems, as shown in Table 2.

Gender did not predict an increase of internalizing and externalizing problems. However, in relation to total problems, girls were more protected than boys (PR = 0.54; 95% CI 0.3 - 0.94). Ethnic group, SES and parents' marital status had no relation with an increased prevalence of internalizing, externalizing and total problems. Besides, the number of family members who are substance abusers, the degree of kinship, and the type of substance consumed by the addicted family member did not predict an increase in the prevalence of emotional and behavioral problems.

The reported use of alcohol by the children increased the prevalence of internalizing problems (PR = 2.53; 95% CI 1.06–6.03). Exposure to psychosocial family stressors was associated with an increase of two to four times in the prevalence of internalizing, externalizing and total problems scales of the CBCL, as can be seen in Table 3. The following risk factors predicted the increase of internalizing problems: hospitalization for psychiatric disorder (PR = 2.5; 95% CI 1.38–4.53), suicide in the family (PR = 4.12; 95% CI 2.6–6.52), suicide attempt in the family (PR = 3.76; 95% CI 2.2–6.42) and physical aggression between family members (PR = 2.29; 95% CI 1.24–4.23). For externalizing problems, the following psychosocial stress factors increased the prevalence rates: hospitalization for psychiatric disorder (PR = 2.14; 95% CI 1.42–3.23), suicide in the family (PR = 1.73; 95% CI 1.01–2.94), death in the family (PR = 1.73; 95% CI 1.1–2.71), and physical aggression between family members (PR = 1.82; 95% CI 1.16–2.85). For total problems, the following psychosocial stress factors predicted the increase in prevalence rates: hospitalization for psychiatric disorder (PR = 1.9; 95% CI 1.22–2.94), suicide (PR = 2.44; 95% CI 1.71–3.5), suicide attempt (PR = 2.07; 95% CI 1.36–3.16), death in the family (PR = 1.73; 95% CI 1.1–2.71) and physical aggression between family members (PR = 1.82; 95% CI 1.16–2.85). Religion background represented a protection factor for externalizing problems (PR = 0.62; 95% CI 0.39-0.98). These results are shown in Table 3.

4. Discussion

To investigate the magnitude of the problem of living with addicted families, caregivers of children from a low-income community of Brazil were interviewed regarding children's mental health indicators, exposure to family psychosocial stressors, and substance use. Results indicated a high prevalence of emotional and behavioral problems, with 26.7% of participants with clinical scores for Internalizing Problems, 40.6% for Externalizing Problems, and 40.6% for Total Problems. These results corroborate the international findings about this vulnerable population, which showed 39.9% of internalizing problems rates, 37.2% of externalizing problems and 42.5% of total problems according to CBCL scale (VanDeMark et al., 2005).

Table 2

Characteristics of the substance use and prevalence of emotional and behavioral problems in children of addicted family members (N = 101).

Variables	n (%)
Number of substance abusers who coexists	
One substance abuser	74 (73.3)
More than one substance abuser	27 (26.7)
Substance abuser member	
Mother	8 (7.9)
Father	61 (60.4)
Mother and father	9 (8.9)
Brothers or sisters	4 (4.0)
Second-degree relatives	19 (18.8)
Substance consumed by addicted family	
Alcohol	54 (53.5)
Illicit drugs	47 (46.5)
Alcohol use by the children	
No	95 (96.9)
Yes	3 (3.1)
Tobacco use by the children	
No	101 (100)
Yes	0 (0)
Internalizing Scale[a]	
Non-clinical	74 (73.3)
Clinical[§]	27 (26.7)
Externalizing Scale[b]	
Non-clinical	60 (59.4)
Clinical [§]	41 (40.6)
Total Problems Scale[c]	
Non-clinical	60 (59.4)
Clinical [§]	41 (40.6)

[§] Scores in the clinical range in comparison to Group 3 cutpoints (Achenbach & Rescorla, 2007).

[a] Includes Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints subscales.

[b] Includes Rule Breaking Behavior and Aggressive Behavior subscales.

[c] Includes all problems items of the CBCL scale.

Considering that the children were recruited from two different programs, a preliminary study investigated the differences of mental health indicators between both groups. The percentage of children with scores in the clinical range on Internalizing, Externalizing and Total Problems scales at CCAs program was considerably higher in comparison to CUIDA program: 51.4% vs. 13.6%, 60% vs. 30.3% and 62.9% vs. 28.8%, respectively (Vilela, Silva, Grandi, Rocha, & Figlie, 2016). Despite the above difference those rates are higher than the 13.4% (CI 95% 11.3–15.9) worldwide pooled prevalence of children and adolescents affected by any mental disorder reported by Polanczyk et al. (2015) in a meta-analysis.

The results of our study are higher than the prevalence rate found by Geschiere et al. (2017) that found 29% of the children with psychosocial problems according to their parents' SDQ reports. Even in comparison with another sample of low-income children from southeast Brazil, on which 24.6% of the children had clinical scores for total problems (Paula et al., 2007), our sample had worse results. This might indicate the severity of combining both risk factors: living in a low-income community and having an addicted family member.

It is important to understand these results considering that differences in prevalence rates of mental health problems may occur due to the methodology used to collect data (Polanczyk et al., 2015). When screening instruments are used, differences also may occur according to the type of informant (Bordin & Paula, 2007). Data from Brazilian studies indicate that prevalence of total problems ranged from 13.5% to 35.2% based on parent reports, from 12.6% to 13.1% based on adolescent self-reports, and from 8.3% to 10.3% based on teacher reports (Bordin, Curto, & Paula, 2010, 2018).

Even considering these differences in rates, our findings indicate that the prevalence of internalizing and externalizing problems in children living with addicted family was much higher than expected. The children from our sample are extremely vulnerable to multiple risk factors during their development, including substance use in the family, poverty and all psychosocial stress factors associated.

A systematic review reported that children living in slums have more behavioral and emotional problems than children living in

Table 3
Prevalence ratios of emotional and behavior problems in relation to associated risk factors (N = 101).

Variables	Internalizing Problems				Externalizing Problems				Total Problems			
	Clinical n (%)	Non-clinical n (%)	PR (95% CI)	p	Clinical n (%)	Non-clinical n (%)	PR (95% CI)	p	Clinical n (%)	Non-clinical n (%)	PR (95% CI)	p
Child characteristics												
Gender												
Female	7 (17.07)	34 (82.93)	0.51 (0.24 - 1.1)	0.09	14 (34.15)	27 (65.85)	0.76 (0.46 - 1.26)	0.29	11 (26.83)	30 (73.17)	**0.54 (0.3 - 0.94)**	0.03
Male	20 (33.33)	40 (66.67)	1		27 (45)	33 (55)	1		30 (50)	30 (50)	1	
Ethnic group												
White	9 (23.68)	29 (76.32)	0.83 (0.42 - 1.66)	0.59	13 (34.21)	25 (65.79)	0.77 (0.46 - 1.3)	0.32	13 (34.21)	25 (65.79)	0.77 (0.46 - 1.3)	0.32
Non-white	18 (28.57)	45 (71.43)	1		28 (44.44)	35 (55.56)	1		28 (44.44)	35 (55.56)	1	
Religion												
No	8 (44.44)	10 (55.56)	1		11 (61.11)	7 (38.89)	1		10 (55.56)	8 (44.44)	1	
Yes	19 (24.68)	58 (75.32)	0.56 (0.29 - 1.06)	0.07	29 (37.66)	48 (62.34)	**0.62 (0.39 - 0.98)**	0.04	30 (38.96)	47 (61.04)	0.7 (0.43 - 1.16)	0.16
Substance use characteristics												
Substance abuser												
Brothers or sisters	2 (50)	2 (50)	2.38 (0.64 - 8.81)	0.2	2 (50)	2 (50)	0.86 (0.3 - 2.47)	0.78	2 (50)	2 (50)	0.95 (0.33 - 2.77)	0.93
Mother/Father or both	21 (26.9)	57 (73.1)	1.28 (0.5 - 3.29)	0.61	28 (35.9)	50 (64.1)	0.62 (0.38 - 1.01)	0.05	29 (37.2)	49 (62.8)	0.71 (0.42 - 1.18)	0.19
Substance consumed												
Second-degree relatives	4 (21.05)	15 (78.95)	1		11 (57.89)	8 (42.11)	1		10 (52.63)	9 (47.37)	1	
Illicit drugs	16 (34.04)	31 (65.96)	1.67 (0.86 - 3.24)	0.13	22 (46.81)	25 (53.19)	1.33 (0.83 - 2.14)	0.24	20 (42.55)	27 (57.45)	1.09 (0.68 - 1.75)	0.71
Alcohol	11 (20.37)	43 (79.63)	1		19 (35.19)	35 (64.81)	1		21 (38.89)	33 (61.11)	1	
Psychosocial stress factors												
Psychiatric hospitalization	9 (56.25)	7 (43.75)	**2.5 (1.38 - 4.53)**	< 0.01	12 (75)	4 (25)	**2.14 (1.42 - 3.23)**	< 0.01	11 (68.75)	5 (31.25)	**1.9 (1.22 - 2.94)**	< 0.01
Family severe disease	10 (31.25)	22 (68.75)	1.19 (0.62 - 2.3)	0.6	13 (40.63)	19 (59.38)	0.98 (0.59 - 1.63)	0.93	14 (43.75)	18 (56.25)	1.09 (0.67 - 1.79)	0.72
Suicide	8 (88.89)	1 (11.11)	**4.12 (2.6 - 6.52)**	< 0.01	6 (66.67)	3 (33.33)	**1.73 (1.01 - 2.94)**	0.04	8 (88.89)	1 (11.11)	**2.44 (1.71 - 3.5)**	< 0.01
Suicide attempt	11 (73.33)	4 (26.67)	**3.76 (2.2 - 6.42)**	< 0.01	9 (60)	6 (40)	1.59 (0.96 - 2.61)	0.07	11 (73.33)	4 (26.67)	**2.07 (1.36 - 3.16)**	< 0.01
Police problems	7 (36.84)	12 (63.16)	1.44 (0.71 - 2.89)	0.31	11 (57.89)	8 (42.11)	1.56 (0.96 - 2.52)	0.07	10 (52.63)	9 (47.37)	1.37 (0.82 - 2.28)	0.23
Death of a family member	11 (40.74)	16 (59.26)	1.78 (0.95 - 3.33)	0.07	16 (59.26)	11 (40.74)	**1.73 (1.1 - 2.71)**	0.02	16 (59.26)	11 (40.74)	**1.73 (1.1 - 2.71)**	0.02
Aggression between family	13 (46.43)	15 (53.57)	**2.29 (1.24 - 4.23)**	< 0.01	17 (60.71)	11 (39.29)	**1.82 (1.16 - 2.85)**	< 0.01	17 (60.71)	11 (39.29)	**1.82 (1.16 - 2.85)**	< 0.01

95% CI = 95% confidence interval.
Results in bold indicate statistically significant association.

rural or non-slum urban areas (Ernst et al., 2013). According to the National Center on Child Abuse and Neglect (2003), in 80% of the American states surveyed, the consumption of substances by parents and poverty are the two major problems among child protective service caseloads. Children of SUDs are three times more likely to be maltreated and four times more likely to be neglected when compared to children of non-dependents. This data indicates that preventive programs are necessary for children living in this condition.

In our study, girls were the most protected regarding total problems, the scale that includes all CBCL's problem items. This result is consistent with Rocha et al.'s (2013) study, on which boys scored significantly higher than girls on externalizing problems. Moreover, Rescorla et al. (2007) indicated that none of the 28 societies with samples of children ages 6–11 showed a significant gender difference on internalizing problems, but boys had significantly higher externalizing scores than girls for 19 of 28 societies.

The analysis of variables that might predict increased prevalence of internalizing and externalizing problems indicated that the type of substance consumed by the addicted family member was not related to emotional or behavioral problems. This finding is compatible with Marmorstein, Iacono, and McGue, (2009) study that found no difference in behavioral disorders considering children of alcohol vs. illicit drug-addicted parents. On the other hand, they differ from Payá, Santoro, Vieira, and Figlie, (2015), who found that children of alcohol-dependent parents were more likely to have internalizing problems and children of illicit drug users were more likely to have externalizing issues. Besides the difference found by Payá et al. (2015), the authors affirm that "both substances are equally harmful and can trigger mental health risks in children, especially younger children" (Payá et al., 2015, p.1). This is consistent with Marmorstein et al. (2009). In that context, we can hypothesize that the difference found between these studies may be related to the age group investigated, sample size, study methodology and, consequently, the statistical analysis used. In addition, it is reasonable to suppose that the combination of these variables (children of SUDs, residents of a slum and exposure to psychosocial stressors) is mediated by aspects related to family dynamics, protection factors, and the interactions experienced by the child, evidencing that there is a wide network of interactions involved in the analyzed outcomes.

The variables that did predict increased prevalence of internalizing and externalizing problems in our sample were related to family psychosocial stressors, such as psychiatric hospitalization, family severe disease, suicide attempt in the family, suicide and physical aggression between family members. These factors are associated with an increase of two to four times in the prevalence of internalizing and externalizing problems. Payá et al. (2015) found similar results: death in the family doubled the risk of developing externalizing problems, and physical aggression between family members was directly correlated with delinquent behavior and withdrawal in children. Therefore, the present study corroborates other studies, showing the role of stressful environmental factors in the etiology of emotional problems in childhood (Halpern & Figueiras, 2004; Straussner & Fewell, 2018).

Religious background was a strong protective factor associated with decrease of externalizing problems in our sample. Others studies found similar results, with better outcome with regard to children's mental health among those with religious background (Cucchiaro & Dalgalarrondo, 2007; Vilela et al., 2016). Based on a comprehensive review of the literature, Moreira-Almeida, Lotufo Neto, and Koenig, (2006) concluded that higher levels of religious involvement are positively associated with indicators of psychological well-being (life satisfaction, happiness, positive affection, and higher morale), and with lower levels of depression, suicidal thoughts, suicide rates, and drug and alcohol use or abuse. Religion can foster socialization, set values of good behavior, and may also promote mental health and quality of life (Cucchiaro & Dalgalarrondo, 2007).

Beyond religion background, Wlodarczyk, Schwarze, Rumpf, Metzner, and Pawils, (2017) described other protective factors for mental health problems in children of parents with SUDs. The factors included secure parent-child attachment, family cohesion and adaptability, accepting mother, the child's relationships with significant adults, lower parenting stress, and high social support for the child. Additionally, other factors were significant predictors of a better mental health outcome at a later assessment point: secure mother-child attachment, flexible use of coping strategies (religion, planning and search for social support) in children, and parental support (Wlodarczyk et al., 2017). These protective factors can be promoted by family-based interventions for children of substance abusing parents. Usher, McShane, and Dwyer, (2015) based on a review of the literature, identified four demi-regularities as being fundamental in generating positive program outcomes: (1) opportunities for positive parent-child interactions, (2) supportive peer-to-peer relationships, (3) the power of knowledge, and (4) engaging hard to reach families using strategies that are responsive to socioeconomic needs and matching services to client lived experience (Usher et al., 2015).

Family-based intervention programs, and also programs for mothers with substance use disorders and their young children, have shown positive results (Straussner & Fewell, 2018). Our results reinforce the need of implementation of preventive centers in areas of lower socioeconomic level, where prevalence rates of mental health problems are higher, as suggested by Fleitlich and Goodman (2002). Moreover, in developing nations and especially in informal settlements, community resources to address mental health disparities and support those children with mental and behavioral health issues are severely limited (Ernst et al., 2013).

High-risk families with multiple needs require the ongoing support of multidisciplinary services (Straussner & Fewell, 2018). However, an overwhelming majority of these exposed children never receive support, mainly due to difficulties in identifying and attracting them into intervention programs. Besides, another challenge is adherence to the program. Grandi, Vilela, and Figlie, (2014) found that the social and economic vulnerability is not only a risk for children of substance abusers living in such conditions, but also a major obstacle to any treatment effort. The greater the social vulnerability, the lower the adherence in the treatment program.

Considering the cost-benefit ratio, one of the main criteria for the implementation of public policies, many studies have proven that prevention programs are highly advantageous, generating savings of up to 10 dollars – for each dollar invested – in treatments for alcohol and other substance abuse (Robertson, David, & Rao, 2003).

Some limitations need to be considered when interpreting our findings. Firstly, although the children have been recruited from two programs with dwellers of the same region, with similar SES, differences were found between them. Thus, the predictors of the prevalence of emotional and behavioral problems may be different from those presented if analyzed as a function of the group.

However, our study results are most likely generalizable to other low-income communities of highly populated cities in developing countries.

Another important limitation is that the data collection on CUIDA program was performed after the participation on intervention program possibly altering the results. Moreover, a great level of difficulty was found in establishing contact with the families of CUIDA database, mainly because many had changed their address and telephone number, making it impossible to reach them. This aspect was very frequent whereas this population has been requiring many geographic changes, including moving to another house in order to find a better condition of life and job opportunities. In addition, Jardim Ângela is a region dominated by trafficking which made it difficult to access some addresses. That is, even with all the efforts undertaken to locate these children, some families resided in addresses that left researchers more at risk than they could assume.

This study is also limited by non-measured data. The CBCL data were not provided by the children, but rather by their mothers or guardians. Researchers (Linares et al., 2006) consider essential to ponder over the effect that the informants have in the assessment, because information given by parents about children behavior problems are affected by their own psychological problems. Since we were not able to assess informant's mental health status, this is a bias to be considered, although CBCL is a world known instrument with proven sensitivity and widely used for such studies (Achenbach & Rescorla, 2007).

Additionally, most studies in low- and middle-income countries have found lower parental education to be associated with more mental health problems (Goodman, Fleitlich-Bilyk, Patel, & Goodman, 2007). However, it was not possible, within this study, to estimate the influence of parents' schooling because there was no convergence in the statistical model. Finally, because of the cross-sectional design, we can not establish a causal relationship between the variables studied and some increase in the prevalence of children's mental health problems, but sheds light on a positive relation and directions for further studies within this population.

5. Clinical implications

The results contributed to better understanding the damage of children exposure to alcohol and illicit drugs in the family environment. In line with international and national studies, implications can be found for the mental health of children living in a poor environment with substance abusers, domestic violence, psychosocial stressors and socioeconomic risk. While it is no longer true to say that people who live in slums are invisible, they are insufficiently visible and as a result continue to be marginalized (Lilford et al., 2016).

The findings indicate that this is a subgroup of the population whose risk of developing mental disorders is significantly higher than average and should be the target of a selective intervention as part of the treatment plan of their parents. Therefore, this study highlights the importance of investing in effective preventive programs and public policies to assist these children.

Conflict of interest

The authors declare no conflict of interest.

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