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Domestic violence and risk of internalizing and externalizing problems in adolescents living with relatives displaying substance use disorders

Violência doméstica e risco de problemas de internalização e externalização em adolescentes com familiares apresentando transtornos por uso de substâncias

DOI: 10.1590/0047-2085000000268

ABSTRACT

Objective: To investigate the association between exposure to domestic violence and increased risk of internalizing and externalizing problems and substance use among adolescents living with relatives with substance use disorder (SUD) at a low-income community of São Paulo, Brazil. **Methods:** A cross-sectional study was conducted with 102 adolescents aged 12-17 years ($M = 14.2$, $SD = 1.7$) who were living with relatives suffering from SUD. Outcomes were measured using the Youth Self-Report (YSR), psychosocial stress factors questionnaire, Drug Use Screening Inventory (DUSI) and Phrase Inventory of Intrafamily Child Abuse (PIICA). **Results:** The sample presented high prevalence of emotional/behavioral problems with YSR's scores in the clinical range for Internalizing Problems (24.5%), Externalizing Problems (21.6%), and Total Problems (26.5%). The presence of mental health problems predicted substance use ($PR = 2.22$; 95% CI = 1.2-4.13), and substance use predicted increased risk of mental health problems. Alcohol use predicted more than double the risk of emotional/behavioral problems ($PR = 2.01$; 95% CI = 1.08-3.76), while illicit drug use was associated with an almost threefold increase in the prevalence of Internalizing ($PR = 2.87$; 95% CI = 1.19-6.89) and Externalizing Problems ($PR = 3.3$; 95% CI = 1.35-8.04). **Conclusion:** Adolescents of relatives with SUD are at risk of developing emotional and behavioral problems. These findings reinforce the need to develop public mental health policies, which include protective interventions to adolescents living in families affected by substance use disorders.

KEYWORDS

Substance-related disorders, adolescent behavior, violence exposure, domestic violence, low-income population.

RESUMO

Objetivo: Investigar a associação entre exposição à violência doméstica e aumento do risco de problemas internalizantes e externalizantes e uso de substâncias entre adolescentes que vivem em famílias com transtorno por uso de substâncias (TUS) em uma comunidade de baixa renda de São Paulo, Brasil. **Métodos:** Estudo transversal com 102 adolescentes de 12 a 17 anos ($M = 14,2$, $DP = 1,7$) que vivem com familiares com TUS. Os desfechos foram avaliados por meio do Inventário de Autoavaliação para Adolescentes (YSR), questionários de fatores de estresse psicossociais, *Drug Use Screening Inventory* (DUSI) e Inventário de Frases de Violência Doméstica (IFVD). **Resultados:** A amostra apresentou altas taxas de problemas emocionais/comportamentais no YSR, sendo 24,5% com escores na faixa clínica para Problemas Internalizantes, 21,6% para Problemas Externalizantes e 26,5% para Problemas Totais. A presença de problemas de saúde mental foi preditora do uso de substâncias ($RP = 2,22$; IC 95% = 1,2-4,13) e o uso de substâncias foi preditor do aumento da prevalência de problemas emocionais/comportamentais. O uso de álcool prediz mais do que o dobro do risco de problemas emocionais/comportamentais ($RP = 2,01$; IC 95% = 1,08-3,76), enquanto o uso de substâncias ilícitas esteve associado com um aumento de quase três vezes na prevalência de Problemas Internalizantes ($RP = 2,87$; IC 95% = 1,19-6,89) e Externalizantes ($RP = 3,3$; IC 95% = 1,35-8,04). **Conclusão:** Adolescentes que convivem diretamente com familiares com TUS estão em risco para o desenvolvimento de problemas emocionais/comportamentais. Os achados reforçam a necessidade de políticas públicas que incluam programas de proteção para adolescentes que vivem em famílias com transtornos causados pelo uso de substâncias.

PALAVRAS-CHAVE

Transtornos relacionados ao uso de substâncias, comportamento do adolescente, exposição à violência, violência doméstica, população de baixa renda.

Received in: Mar/07/2020. Approved in: Apr/05/2020

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INTRODUCTION

Domestic violence and substance-related disorder remains a significant public health concern contributing to major social, economic, developmental and psychological stressors that affect families and societies within multiple generations, producing a huge global disease burden^{1,2}. Although substance use disorder (SUD) is presented as a problem of the dependent, families are also profoundly affected by the family member's addiction³. These are under-researched areas, especially in low- and middle-income countries (LMICs), with important implications for policies and clinical interventions, particularly for the mental health development of children and adolescents in vulnerable situations^{2,4,5}.

The prevalence of children and youths living with a person suffering from SUD is high. In the United States (US), about 8.7 million (12.3%) children and youths (under 18 years old) live in households with at least one parent with SUD⁶, 7.5 million (10.5%) live in households with at least one parent who has an alcohol use disorder (AUD), and 2.1 million (2.9%) live in households with at least one parent who had a previous illicit drug use disorder⁶. A Swedish study demonstrated that approximately 3%-4% of all children under the age of 18 years have experienced parent's AUD⁷. British national surveys indicated that 6% of children under the age of 16 years live with an adult who has an AUD⁸. Brazilian data from the National Survey of Families of Substance Dependents held in 2012, including 3,153 families, indicated the presence of social vulnerabilities and SUD in the homes. The same research estimated that households in Brazil have an average of 3.5 people, which leads to an estimative of a least 28 million people living with a SUD dependent⁹.

Evidence shows that adolescents whose parents suffer from SUD are at great risk of developing mental health disorders or behavior problems themselves (e.g., poorer parent-child relationships and more emotional symptoms, low self-esteem, loneliness and depression), since substance use in parents increases the possibility of substance abuse by their children^{10,11}. This increase in risk of addiction results from both genetic and environmental factors. When the parent has substance abuse problems, the family is generally unsafe, unpredictable, chaotic, and disorganized. Parents with SUD not only have fewer parenting skills, but also have less control and supervision over their children¹⁰. Moreover, parent-child interaction quality is not satisfactory, and more parent-child conflicts might be observed in such families. These issues can have negative effects on the socialization process (social skills training), and can lead to the development of depressive symptoms, besides internalizing and externalizing problems^{10,12,13}.

Additionally, children living in slums are at high risk of multiple exposures to violence. Fidalgo *et al.* found that having experienced any violent childhood event and living

under a low socioeconomic status (SES) were significantly associated with both having internalizing and externalizing disorders according to the DSM-IV diagnostic criteria¹⁴.

This study aimed at: (1) estimating the prevalence of emotional and behavioral problems among adolescents aged 12-17 years living with relatives that suffer from a SUD in a low-income community of São Paulo, southeastern Brazil; (2) investigating the association between exposure to domestic violence and the increasing risk of internalizing and externalizing problems; and (3) evaluating substance use among these adolescents.

METHODS

Study design and setting

A cross-sectional study was conducted in Jardim Ângela, a conglomerate of slums located in one of the most vulnerable regions of São Paulo city. The Jardim Ângela district belongs to the sub-municipality of M'Boi Mirim, which is 62.1 km² in area; of the 563,305 inhabitants, 295,434 reside in Jardim Ângela, situated on the extreme outskirts of the city of São Paulo with alarming rates of social exclusion, economic helplessness and urban violence. The situation of Jardim Ângela is even more alarming when the effects of exposure to such high social vulnerability on future generations are taken into account. The population is predominantly of young people: 52.9% are under 24 years old. The Youth Vulnerability Index is 76 on a scale of 0-100, for which 65 is the cut-point for the most vulnerable districts¹⁵. The precarious economic conditions, 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 people¹⁶. A study conducted by Akerman and Bousquat¹⁷ showed that Jardim Ângela was 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 cases per 100,000 inhabitants).

INSTRUMENTS

Sociodemographic questionnaire: with questions to assess sex at birth (female, male), age group (≤ 14 , ≥ 15), marital status (married, unmarried), race (white, non-white), years of education (≤ 8 , ≥ 9), religious affiliation (yes, no), current occupational status (employed, not employed).

Brazilian Association of Research Companies scale: this determines the purchasing power of urban families and takes into consideration the possession of household goods, and householder's educational level. Families are sorted into subgroups (A1, A2, B1, B2, C, D, and E) according to their

score. Class A1 represents the most-favored economic level, while Class E represents the least-favored one¹⁸.

Family CAGE-AID (Adapted to Include Drugs): a screening tool with four items that aims to detect family problems related to substance use. The Family CAGE was adapted by Frank *et al.*¹⁹ from the original CAGE questionnaire and presented strong internal consistency (Cronbach's alpha coefficients of 0.84 to 0.89)¹⁹. For this study, it was adapted to measure substance problems as well, following Brown and Rounds' suggestion²⁰. Family CAGE-AID is advantageous for its potential in detecting substance dependence in community or epidemiological studies, when the primary user may be unavailable or non-cooperative²¹. In our study, the cut-off point used was of at least one affirmative answer, which was established by Castells and Furlanetto²², with good sensitivity (93.8%) and specificity (85.5%).

Psychosocial stress factor questionnaire: which investigates situations of psychosocial stress. The selection of items was based on the criteria established by the International Classification of Diseases (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 law, death in the family, and physical aggression among family members²³.

Drug Use Screening Inventory (DUSI): adapted and validated by De Micheli and Formigoni²⁴ for Brazilian samples, with 80% sensitivity, and 90% specificity²⁵. In this study, only data on substance type and frequency of use were analyzed. The Brazilian version of the DUSI presented strong internal consistency reliability for the whole sample (drug-dependents and non-drug-dependent adolescents), with an average across all 10 scales of 0.96 (SD = 0.02) for Cronbach's alpha reliability coefficient, and 0.88 (SD = 0.08) for the split-half reliability coefficient.

Youth Self-Report (YSR): allows adolescents (aged 11-18 years) to assess their own emotional and behavioral problems²⁶. Includes three broad-band scales: (1) Internalizing Problems, with problems such as anxiety, depression, somatic complaints, and social withdrawal; (2) Externalizing Problems, which includes rule-breaking behavior, and aggressive behavior; and (3) Total Problems, the sum of all problem's items. Scores are classified within normal and clinical range in comparison with a normative sample of adolescents non-referred for mental health services. The version used in this study was validated for Brazilian adolescents²⁷, with good fit to the original factorial model (root-mean-square error of approximation = 0.032), high internal consistency values (Cronbach's alpha for Total Problems' scale = 0.924), and acceptable sensitivity (35.4%) and specificity (83.5%) rates²⁷.

Phrase Inventory of Intrafamily Child Abuse (PIICA): developed by Agosta *et al.*^{28,29} to investigate exposure to domestic violence and/or abuse. PIICA aims

to assess evidence or suspicion of domestic violence and associated disorders that may occur due to the experience of physical and/or sexual violence. It was validated in Brazil by Tardivo and Pinto Junior³⁰, with indicatives of good internal consistency (Cronbach's alpha = 0.85).

Procedures

The adolescents were recruited from two social programs that are offered for low-income families in the Jardim Ângela neighborhood: The Utility Intervention and Support Center for Children of Substance Abusers (CUIDA) and Centers for Children and Adolescents (CCAs).

CUIDA is a preventive program aimed at assisting children and adolescents who live with addicted family members. It offers mental health assistance, including psychological, social, and medical care. Moreover, other activities, such as educational, recreational, musical, sports, and computer training, are offered³¹. CUIDA's database includes 791 children and adolescents who attended the program. During data collection, 273 were still adolescents (12 to 17 years old). Researchers tried to locate all participants by either a phone call or home visits. A total of 67 (25%) adolescents agreed to participate in the study, 142 (52%) were not located, 30 (11%) refused to participate, 23 (8%) were institutionalized and were not living with their family of origin, 2 (0.7%) reported that they had never attended CUIDA, and 9 (3.3%) had problems with drugs, drug trafficking, and were homeless or imprisoned.

CCAs are attended by children and adolescents with disabilities; who were withdrawn from child labor, and/or subjected to other rights violations; who returned to the family after a protective measure; whose families are beneficiaries of income transfer programs; and who live in vulnerable and risky situations. The program acts in the scope of the prevention of social risk situations by offering recreational, socio-educational, sports, cultural, and recreational activities that foster the development of children and adolescents and their creativity, cognitive, and group living skills. Thirty-five (35) children were recruited from this program.

In both programs (CUIDA and CCAs), all activities take place outside the regular school-period, so that all youths can attend school regularly. The inclusion criteria for the present study was to live with at least one family member with SUD and to reside in Jardim Ângela. The exclusion criteria were not having relatives with SUD, being under an arrest warrant, and not agreeing to participate in the study.

The exposure to relatives with SUD was informed by professionals from the two programs where the sample was recruited. This information was confirmed through the Family CAGE-AID questionnaire to identify only those who were living with a family member with SUD. The researcher, a trained psychologist, conducted a 60-minute face-to-face individual interview with all the participants, after authorization of the caregiver, either in the mentioned programs or during home visits.

Statistical analysis

The variables were described by absolute frequency and percentage. To estimate the prevalence ratios (PR), a log-binomial regression model was used (variables were binary)³². All analyses were performed using SAS 9.2 software, with a 5% significance level.

Socioeconomic variables, psychosocial stressors, and the means of the violence scores versus the response variable (substance use; Internalizing, Externalizing, and Total Problems) were entered into the simple regression model. Simple regression was performed, and the sample size was a limiter to follow the adjusted regression. Although the calculation of gross prevalence ratios does not point to the prevalence ratio of each variable in the presence of others, this model offers the measure of correct effect and its association with the outcomes analyzed (substance use and Internalizing, Externalizing and Total Problems).

Ethical issues

The study was approved by the Ethical Committee of the University (CEP 1843/09) and by the Ethical Research Committee of the Municipal Health Department of São Paulo (CAAE: 05.174/11), taking into account all ethical guidelines displayed on Resolution No. 196/96 of the National Health Council of the Ministry of Health. All protocols included an informed consent form, properly signed, ensuring the anonymity of the participant and confidentiality of information. All guardians were informed of the nature, content, and purpose of the interviews and signed an Informed Consent Form authorizing the participation.

RESULTS

A total of 102 adolescents who were living with relatives suffering from SUD participated in the study. The sample included 58 girls (56.9%), and 44 boys (43.1%), aged 12–17 years ($M = 14.2$, $SD = 1.7$). The majority of participants had mixed race background (48%), 32.4% were white, and 19.6% black. Class C was the most prevalent economic status (66.7%), followed by class D (20.6%) and B2 (12.7%). Having some religious background was reported by 71.6%. Descriptive statistics with sociodemographic data and exposure to situations of psychosocial stress reported by the adolescents are presented on table 1.

Regarding the parents, 51% were married or living together, 38.2% were divorced or separated, 5.9% were single, and 4.9% were widowed. On living situation, 49% lived with both father and mother, 27.5% only with mother, 6.9% with mother and stepfather, and 7.8% with other relatives. The majority (94.1%) was currently studying, and 7.8% had a job.

Table 1. Sociodemographic factors, stressful events, substance use, and mental health problems ($N = 102$)

Variables	n (%)
Adolescent characteristics	
Gender (female)	58 (56.9)
Ethnic group (non-white)	69 (67.6)
Brazil Economic Classification Criteria	
Class B2	13 (12.7)
Class C	68 (66.7)
Class D	21 (20.6)
Religious background	73 (71.6)
Parents' marital status	
Married or living together	52 (51.0)
Psychosocial stress factors	
Family stressful situations in the last 12 months	
Psychiatric hospitalization	8 (7.8)
Family severe disease	23 (22.5)
Suicide	2 (2.0)
Suicide attempt	4 (3.9)
Problems with the law	8 (7.8)
Death of a family member	18 (17.6)
Physical aggression between family	28 (27.5)
Substance user characteristics	
Number of substance abusers who coexist	
One substance abuser	69 (67.6)
More than one substance abuser	30 (29.4)
Substance abuser member	
Mother	7 (6.9)
Father	47 (46.1)
Mother and father	10 (9.8)
Brothers or sisters	4 (3.9)
Second-degree relatives	34 (33.3)
Substance consumed by addicted family	
Alcohol	57 (57.0)
Illicit drugs	43 (43.0)
Substance use by the adolescent	
Alcohol	26 (25.5)
Tobacco	5 (4.9)
Illicit drugs	3 (2.9)
Emotional and behavioral problems	
Internalizing Problems	25 (24.5)
Externalizing Problems	22 (21.6)
Total Problems	27 (26.5)

On sexual behavior, 29.4% reported having some sort of sexual activity. Of those, 14.3% did not use any birth control, 14.3% used it sometimes, 14.3% used it usually, and 57.1% always used it. The contraceptive method used by most adolescents was condom (76.9%), and 19.2% used

combined methods. Regarding the association of substance use and sex, 26% never consumed alcohol or drugs to have sexual intercourse, but 2% declared that they did. Three adolescents (2.9%) reported having children. No teenager reported having problems with the law.

Family psychosocial stress factors

Table 1 displays the exposition to psychosocial stress factors. It is noteworthy that 66.7% were exposed to some important stressor event in the last 12 months, with a high prevalence of exposure to family psychosocial stressors, such as physical aggression (27.5%), severe disease (22.5%), death (17.6%), problems with the law (7.8%), hospitalization for psychiatric disorder (7.8%), suicide attempt (3.9%), and suicide (2%).

Relatives' SUD characteristics and prevalence of substance use by the adolescents

Most adolescents (67.6%) cohabited with one relative with SUD, but 29.4% lived with more than one. For 46.1%, the relative with SUD was the fathers, 6.9% was for the mother, and 9.8% was for both parents. Moreover, 3.9% lived with brothers or sisters who suffered from SUD, and 33.3% with other relatives, such as grandparents and uncles. Most of the family members with SUD (57%) used alcohol, whereas 43% consumed illicit drugs (see table 1). The illicit substances users were mostly poly-users (79%), while 12% used only marijuana, 7% cocaine, and 2% solvent.

Regarding substance use by adolescents, 25.5% declared that they consume alcoholic beverages, 4.9% were tobacco smokers, and 2.9% were illicit drug users. The frequency of use was: monthly (19%), weekly (1%), and almost every day (1%). Consumption in the last month was reported by 79% of the sample. For tobacco, 96.1% reported no consumption in the last month. However, 2% reported consumption in the last month, 1% weekly consumption, and 1% almost every day. Only one adolescent declared monthly use of cocaine, and 2% reported monthly use of marijuana. The younger adolescents (aged 12-14 years) presented lower substance use prevalence [PR = 0.1; 95% confidence interval (CI) = 0.03-0.32] in comparison with the older ones (aged 15-17 years).

Prevalence of emotional and behavioral problems and associated risk factors

The prevalence of scores in the clinical range of the YSR was 24.5% for Internalizing Problems, 21.6% for Externalizing Problems, and 26.5% for Total Problems, as shown in Table 1. Gender, age group, ethnic group, economic status, religious background, and parental marital status had no association with an increased prevalence of Internalizing, Externalizing, and Total Problems. Moreover, mothers and fathers schooling did not predict increases in problems' scores (see table 2).

The number of relatives with SUD and their relationship with the adolescents did not predict an increase in the

prevalence of Internalizing, Externalizing, and Total Problems. The type of substance consumed by the relative with SUD did not affect the prevalence of Internalizing and Externalizing problems, but it affected the prevalence of Total Problems: the use of illicit substances increased its prevalence (PR = 1.93; 95% CI = 1-3.72).

The consumption of any substance by the adolescent, either legal or illegal, predicted more than double the risk of emotional and behavioral problems. Specifically, alcohol use was related with a twofold risk for Total Problems (PR = 2.01; 95% CI = 1.08-3.76), while tobacco use was related to more than a threefold increase in the prevalence of Externalizing Problems (PR = 3.06; 95% CI = 1.35-6.97), and double the risk for Total Problems (PR = 2.43; 95% CI = 1.09-5.37). Illicit drug use was associated with an almost threefold increase in the prevalence of Internalizing Problems (PR = 2.87; 95% CI = 1.19-6.89), more than three times the prevalence of Externalizing Problems (PR = 3.3; 95% CI = 1.35-8.04), and double risk of Total Problems (PR = 2.64; 95% CI = 1.11-6.29), as shown in table 2.

The presence of emotional and behavioral problems also predicted substance use. When Externalizing and Total Problems were in the clinical range, the prevalence of substance use was increased twofold for Externalizing Problems (PR = 2.14; 95% CI = 1.15-3.99) and Total Problems (PR = 2.22; 95% CI = 1.2-4.13).

Exposure to family psychosocial stressors was associated with an increase of two to three times in the prevalence of Internalizing Problems. No association was found with stressors and the increase in prevalence of Externalizing and Total Problems. The following risk factors predicted increases in Internalizing Problems: suicide attempt in the family (PR = 3.34; 95% CI = 1.70-6.56), and family problems with the law (PR = 2.24; 95% CI = 1.02-4.93) (see table 2).

Exposure to domestic violence

Adolescent exposure to domestic violence increases the risk of developing mental health problems. The outcomes of domestic violence, including cognitive, emotional, behavioral, and physical disorder, had a positive association with the increase of Internalizing, Externalizing and Total problems. When adolescents were divided into two groups using their YSR's scores (normal x clinical range), PIICA's scores were higher for the clinical group.

Several domestic violence outcomes were associated with the increased risk of Internalizing Problems: cognitive disorders (PR = 1.39; 95% CI = 1.14-1.71), emotional disorders (PR = 1.16; 95% CI = 1.10-1.23), behavioral disorders (PR = 1.16; 95% CI = 1.04-1.30), and physical disorders (PR = 1.90; 95% CI = 1.25-2.88). Moreover, were cognitive disorders (PR = 1.28; 95% CI = 1.04-1.59), emotional disorders (PR = 1.15; 95% CI = 1.05-1.25), and physical disorders (PR = 1.64; 95% CI = 1.02-2.62). Lastly, cognitive (PR = 1.5; 95% CI = 1.24-1.81),

emotional (PR = 1.11; 95% CI = 1.02-1.21), and physical disorders (PR = 2; 95% CI = 1.41-2.83) were also associated with the increased risk of Total Problems. Overall, results indicated that the higher the PIICA score, the greater the

prevalence of YSR's emotional and behavioral problems. Social disorder was the only scale for which no significant differences were found between YSR's clinical and non-clinical groups, as shown in table 3.

Table 2. Prevalence ratios of emotional and behavioral problems in relation to associated risk factors (N = 102)

Variables	Internalizing Problems				Externalizing Problems				Total Problems			
	Clinical (%)	Non-clinical (%)	PR (95% CI)	p	Clinical (%)	Non-clinical (%)	PR (95% CI)	P	Clinical (%)	Non-clinical (%)	PR (95% CI)	p
Sociodemographic characteristics												
Gender												
Female	27.59	72.41	1.35 (0.66-2.76)	0.41	22.41	77.59	1.1 (0.52-2.33)	0.81	25.86	74.14	0.95 (0.5-1.82)	0.87
Male	20.45	79.55	1		20.45	79.55	1		27.27	72.73	1	
Age group (years)												
12 to 14	30.36	69.64	1.75 (0.83-3.67)	0.14	23.21	76.79	1.19 (0.56-2.52)	0.66	30.36	69.64	1.4 (0.71-2.75)	0.33
15 to 17	17.39	82.61	1		19.57	80.43	1		21.74	78.26	1	
Ethnic group												
White	24.24	75.76	0.98 (0.47-2.04)	0.97	9.09	90.91	0.33 (0.11-1.04)	0.06	18.18	81.82	0.6 (0.27-1.34)	0.21
Non-White	24.64	75.36	1		27.54	72.46	1		30.43	69.57	1	
Economic status												
Class B2	23.08	76.92	1.62 (0.38-6.84)	0.51	30.77	69.23	1.29 (0.42-3.95)	0.65	30.77	69.23	1.29 (0.42-3.95)	0.65
Class C	27.94	72.06	1.96 (0.64-5.96)	0.24	19.12	80.88	0.8 (0.32-1.99)	0.64	26.47	73.53	1.11 (0.47-2.63)	0.81
Class D	14.29	85.71	1		23.81	76.19	1		23.81	76.19	1	
Religious background												
No	13.79	86.21	1		24.14	75.86	1		20.69	79.31	1	
Yes	28.77	71.23	2.09 (0.78-5.55)	0.14	20.55	79.45	0.85 (0.39-1.87)	0.69	28.77	71.23	1.39 (0.63-3.09)	0.42
Parents' marital status												
Married or living together	26.92	73.08	1.22 (0.62-2.43)	0.56	17.31	82.69	0.67 (0.31-1.42)	0.29	23.08	76.92	0.77 (0.4-1.48)	0.43
Single or divorced	22	78	1		26	74	1		30	70	1	
Addicted family characteristics												
Substance abuser member												
Brothers	25	75	0.85 (0.14-5.02)	0.86	0	100	-	0.99	0	100	-	0.99
Mother/father/both	21.9	78.1	0.74 (0.37-1.49)	0.41	21.9	78.1	0.93 (0.43-1.99)	0.85	25	75	0.77 (0.41-1.47)	0.43
Other family member	29.41	70.59	1		23.53	76.47	1		32.35	67.65	1	
Substance consumed												
Illicit drugs	32.56	67.44	1.69 (0.85-3.34)	0.13	27.91	72.09	1.77 (0.82-3.81)	0.15	37.21	62.79	1.93 (1-3.72)	0.05
Alcohol	19.3	80.7	1		15.79	84.21	1		19.3	80.7	1	
Substance use by the adolescent												
Alcohol	30.77	69.23	1.38 (0.67-2.81)	0.38	34.62	65.38	2.02 (0.98-4.17)	0.06	42.31	57.69	2.01 (1.08-3.76)	0.03
Tobacco	40	60	1.69 (0.54-5.23)	0.36	60	40	3.06 (1.35-6.97)	0.01	60	40	2.43 (1.09-5.37)	0.03
Illicit drugs	66.67	33.33	2.87 (1.19-6.89)	0.02	66.67	33.33	3.3 (1.35-8.04)	<0.01	66.67	33.33	2.64 (1.11-6.29)	0.03
Family psychosocial stressors												
Psychiatric hospitalization	37.5	62.5	1.60 (0.61-4.21)	0.34	12.5	87.5	0.56 (0.09-3.64)	0.54	37.5	62.5	1.47 (0.56-3.83)	0.43
Family severe disease	21.74	78.26	0.86 (0.36-2.04)	0.73	26.09	73.91	1.29 (0.57-2.91)	0.54	26.09	73.91	0.98 (0.45-2.14)	0.96
Suicide	50	50	2.08 (0.50-8.70)	0.31	50	50	2.38 (0.57-10.02)	0.24	100	0	-	-
Suicide attempt	75	25	3.34 (1.70-6.56)	<0.01	25	75	1.17 (0.2-6.64)	0.86	100	0	-	-
Problems with the law	50	50	2.24 (1.02-4.93)	0.04	12.5	87.5	0.56 (0.09-3.64)	0.54	50	50	2.04 (0.94-4.45)	0.07
Death of a family member	22.22	77.78	0.89 (0.35-2.28)	0.81	33.33	66.67	1.75 (0.8-3.85)	0.16	33.33	66.67	1.33 (0.63-2.83)	0.45
Aggression between family	25	75	1.03 (0.48-2.19)	0.94	25	75	1.23 (0.56-2.7)	0.6	35.71	64.29	1.55 (0.81-2.97)	0.18

95% CI: 95% confidence interval.

Results in bold indicate statistically significant associations.

Table 3. Exposure to domestic violence and increased risk of emotional and behavioral problems among adolescents ($N = 102$)

		Disorders	n	Mean (SD)	PR (95% CI)	P
Internalizing Problems						
Clinical	Cognitive		25	3.08 (1.55)	1.39 (1.14-1.71)	<0.01
	Emotional		25	7.96 (3.1)	1.16 (1.10-1.23)	<0.01
	Social		25	2.4 (1.12)	1.04 (0.79-1.35)	0.79
	Behavioral		25	5.28 (2.09)	1.16 (1.04-1.30)	<0.01
	Physical		25	0.68 (0.75)	1.90 (1.25-2.88)	<0.01
Non-clinical	Cognitive		77	1.99 (1.45)		
	Emotional		77	4.87 (2.77)		
	Social		77	2.32 (1.25)		
	Behavioral		77	3.92 (2.36)		
	Physical		77	0.32 (0.52)		
Externalizing Problems						
Clinical	Cognitive		22	2.91 (1.51)	1.28 (1.04-1.59)	0.02
	Emotional		22	8 (3.48)	1.15 (1.05-1.25)	<0.01
	Social		22	2.23 (1.27)	0.92 (0.66-1.27)	0.61
	Behavioral		22	6.23 (2.18)	–	–
	Physical		22	0.64 (0.66)	1.64 (1.02-2.62)	0.04
Non-clinical	Cognitive		80	2.08 (1.51)		
	Emotional		80	4.98 (2.72)		
	Social		80	2.38 (1.21)		
	Behavioral		80	3.71 (2.11)		
	Physical		80	0.35 (0.58)		
Total Problems						
Clinical	Cognitive		27	3.3 (1.41)	1.5 (1.24-1.81)	<0.01
	Emotional		27	7.81 (3.64)	1.11 (1.02-1.21)	0.01
	Social		27	2.22 (1.22)	0.91 (0.69-1.22)	0.54
	Behavioral		27	5.85 (2.09)	–	–
	Physical		27	0.74 (0.71)	2 (1.41-2.83)	<0.01
Non-clinical	Cognitive		75	1.88 (1.41)		
	Emotional		75	4.84 (2.54)		
	Social		75	2.39 (1.22)		
	Behavioral		75	3.68 (2.19)		
	Physical		75	0.29 (0.51)		

95% CI: 95% confidence interval.

Results in bold indicate statistically significant associations.

DISCUSSION

This study was conducted with a sample of adolescents who is highly vulnerable due to several factors, including living with at least one relative with SUD, mainly the father³³. The overwhelming majority was exposed to at least an important stressor event in the last 12 months (including physical aggression and death), 14.3% do not use any birth control, and 25.5% are already consuming alcohol. Almost a quarter was exposed to domestic violence, and the outcomes of domestic violence (cognitive, emotional, behavioral, and

physical disorder) were positively associated with increased risks of internalizing and externalizing problems. Those factors are known for predicting substance use³⁴.

Overall, 24.5% had score on the clinical range for Internalizing Problems, 21.6% for Externalizing Problems, and 26.5% for Total Problems. The rates of emotional and behavioral problems 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.* in a recent meta-analysis³⁵. Such data reinforce the need to promote public mental health policies,

which include protective interventions for children from disadvantaged family backgrounds, such as those living in this vulnerable neighborhood of São Paulo, Brazil.

Miettunen *et al.*³⁶ found that externalizing problems may precede adolescent substance use in both genders, and, among boys, substance use also precedes criminal behaviors. The same study reported that internalizing problems may be followed by substance use in girls and that externalizing problems at age 8 years are associated with later substance use³⁶. After adjustment for sociodemographic factors, the authors found that criminality and substance use, especially among boys, can be predicted by parental alcohol use and psychiatric disorders, and by early externalizing and internalizing problems³⁶. Moreover, girls' cannabis use (odds ratio = 3.2, 95% CI = 1.4-7.3) and alcohol use (odds ratio = 2.1, 95% CI = 1.1-4.2) predicted internalizing disorders in adulthood³⁶.

Meque *et al.*³⁴, in a review of 12 longitudinal studies, observed that internalizing symptoms increased the risk of young adult alcohol use disorders by 21% (odds ratio = 1.21; 95% CI = 1.05-1.39), and that externalizing symptoms increased the risk by 62% (odds ratio = 1.62, 95% CI = 1.39-1.90).

Our findings are similar to those reported by other researchers^{34,36}, and confirm data found in other countries¹⁰, including those with socioeconomic and cultural levels higher than Brazil^{7,8,13}. Indeed, it is noteworthy that gender, age group, ethnic group, economic status, religious background, and parental marital status had no association with an increased prevalence of internalizing, externalizing and total problems in our sample. Moreover, mother's and father's schooling did not predict increased emotional and behavioral problems, as was expected initially. Similar to what was found in a sample of 511 urban families in six LMICs (China, Colombia, Jordan, Kenya, the Philippines, and Thailand), consistent associations were found between chaos, danger, affectionate, and harsh parenting and adolescent adjustment problems. In that study, conducted by Deater-Deckard *et al.*¹⁰, there was some support for the hypothesis, with nearly all countries showing a modest indirect effect of maternal hostility (but not affection) for adolescent externalizing, internalizing, and scholastic problems. Results provide further evidence that chaotic homes and dangerous neighborhood environments increase the risk for adolescent maladjustment in LMICs contexts via harsher maternal parenting¹⁰.

Emotional and behavioral problems are associated with substance use, sometimes as predictors of the risk for use, sometimes because of substance use. After all, which comes first, mental health problems or substance use problems? Rothman and Greenland³⁷ showed an extensive analysis about the influence of genetic and environmental risk factors for common psychiatric and SUD in men and women. According to their study, to understand the causal mechanisms, important principles may be considered, such

as (1) multicausality – A given disease can be caused by more than one causal mechanism, and every causal mechanism involves the joint action of a multitude of component causes; (2) interaction among causes – The causal pie model posits that several causal components act in concert to produce an effect. “Acting in concert” does not necessarily imply that factors must act at the same time. (3) strength of a cause – A given specific causal mechanism, any of the component causes can have strong or weak effects.

In short, every case of diseases has both genetic and environmental causes^{37,38}. Future investigations can explain how these factors are combined to produce the clinical outcomes observed in children of families affected by SUD. Because of the immense diversity of issues surrounding SUD, treatment requires multiple approaches that encompass different therapeutic settings. Thus, the most varied treatment modalities must be available in a process of continuum care according to the needs of each individual at that moment, respecting a path of care that evolves with the severity of the problem. Resources, ranging from primary prevention to complex interventions in inpatient units, should be integrated for an effective care policy. In Brazil, only 19.8% of the children/adolescents with a psychiatric disorder have used mental health treatment services in the last 12 months³⁹. Looking at this neglected demand does not mean “medicalizing childhood”, but preventing future harm, especially that related to substance use. Furthermore, many studies have proved that prevention programs are highly advantageous, generating savings of up to 10 dollars for each dollar invested in treatments for alcohol and other substance abuse⁴⁰.

Current prevention programs tend to act in a multifactorial and multidimensional way. In other words, it is desirable for preventive attention directed to several domains of the individual's life. Prevention programs should be designed to reinforce positive aspects (protective factors) in the life of the individual or of the group he is in and to reduce negative aspects (risk factors) that may be harmful to them. An organized society may charge response for governmental and non-governmental actions aimed at providing public services and policies that can minimize the risks of substance use. Preventive strategies are also those that focus on improving the quality of life of the community, strengthening family and institutional ties, and caring of the population physical and emotional health⁴¹.

Among the limitations of this study, the small convenience sample must be listed. Our data cannot be generalized because the study was conducted with a selected sample of adolescents who attend social programs, meaning they were able to access services that are not available for most adolescents. Population or representative studies of all similar services in the city of São Paulo might provide a broader

picture of the problem. The procedure used to identify the relative with SUD is also a limitation. The information was given by the adolescent, and it reflects their perception of the relative's substance use. Although the researchers did not have access to the substance user, Family CAGE-AID is an advantageous instrument for its potential in detecting substance dependence in a community or epidemiological studies where the primary user may be unavailable or non-cooperative²².

Importantly, data were collected in a region that is difficult to access due to its location, the traffic dealers' domain, and the risk associated with this scenario. Thus, the rates found represent adolescents who had access to services and can be understood as "the tip of the iceberg", as indicators of how high these rates may be. Furthermore, it was also important to consider that the most severely compromised cases were either not located or refused to participate in the study. Although our data cannot be generalized, they can help us understand how harmful it can be to be exposed to substance use in the family, to domestic violence, and to live in a region of such socioeconomic vulnerability.

This study is also limited by non-measured data. The YSR gives the adolescents' perspective, but there was no access to the information given by parents about the adolescents' behavior problems. It would be very interesting to have information from a multiple-informant perspective. Finally, because of the cross-sectional design, we cannot establish a causal relationship between the studied variables and the increase in the prevalence of adolescents' mental health problems, but it does shed light on a positive relation, and on directions for further studies with this population.

The high prevalence of youth in this sample and in Brazilian general population living with at least one relative with SUD⁹ highlights the potential breadth of substance use prevention and treatment needs for the whole family – considering substance use treatment for the affected adults, and prevention and supportive services for their children⁶.

The findings of this study summarize efforts to give voice to a population that is extremely vulnerable to multiple risk factors during their development, including substance use in the family, poverty, and all associated psychosocial stress factors, as found in this study and in another study recently published with a sample of Brazilian children aged 6-11 years⁴².

CONCLUSIONS

Our findings indicate association between exposure to domestic violence and increased risk of internalizing and externalizing problems and substance use among adolescents' exposed to alcohol and illicit drugs in the family environment. These findings reinforce the need to develop

public mental health policies, which include protective interventions to adolescents from disadvantaged family backgrounds.

INDIVIDUAL CONTRIBUTIONS

Thaís dos Reis Vilela – Contributed to the study conception and design, data analysis and interpretation, writing and review of the article and approval of the final version to be published.

Marina Monzani da Rocha – Contributed to the study conception and design, data analysis and interpretation, writing and review of the article and approval of the final version to be published.

Neliana Buzi Figlie – Contributed to the study conception and design, data analysis and interpretation, writing and review of the article and approval of the final version to be published.

Sandra Cristina Pillon – Contributed to the analysis and interpretation of data, writing and review of the article and approval of the final version to be published.

Alessandra Diehl – Contributed to the interpretation of the data, writing and review of the article and approval of the final version to be published.

Jair de Jesus Mari – Contributed to the study conception and design, data analysis and interpretation, writing and review of the article and approval of the final version to be published.

CONFLICT OF INTERESTS

The author(s) declared no potential conflict of interests with respect to the research, authorship and/or publication of this article.

ACKNOWLEDGEMENTS

This project is part of the Research and Innovation Grant for Prevention of Mental Disorders and Use of Alcohol and other Drugs, "Pesquisas e Inovações em Prevenção de Transtornos Mentais e Uso de Álcool e Outras Drogas", funded by the Brazilian Ministry of Health (TED: 176/2017).

The main author is supported by a doctorate scholarship from the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (Capes) in Brazil (Finance Code 001).

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