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EDITORA

EXPOSURE OF CHILDREN TO ENVIRONMENTS WITH THE POTENTIAL TO COMPROMISE CHILD AND ADOLESCENT DEVELOPMENT IN BASIC HEALTH UNITS IN RIBEIRÃO PRETO, SÃO PAULO STATE

EXPOSIÇÃO INFANTIL A AMBIENTES COM POTENCIAL DE COMPROMETIMENTO DO DESENVOLVIMENTO INFANTOJUVENIL EM UNIDADES BÁSICAS DE SAÚDE DE RIBEIRÃO PRETO-SP

EXPOSICIÓN INFANTIL A ENTORNOS CON POTENCIAL DE COMPROMETER EL DESARROLLO INFANTIL Y JUVENIL EN UNIDADES BÁSICAS DE SALUD DE RIBEIRÃO PRETO-SP

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Mariana Carrera[1], Maria Eduarda Osório de Oliveira[2], Isabela Queiroz Guedes[3], Diego Gabriel Ribeiro Barbosa[4], Bárbara da Silva Paschoal[5], Artur de Paula Martins Tavares[6], Juliah Radharani Lobo Capillé[7], Rodrigo José Custodio[8], Viviane Imaculada do Carmo Custodio[9]

ABSTRACT

Neurodevelopment is influenced by the interaction of neurological and biological factors and the environment, such as education, daily stimuli, and healthy family relationships. Toxic stress, caused by intense and continuous adversity, can impair neurodevelopment. One risk factor for this ongoing stress is family dysfunction, especially parental alcohol and drug abuse. In this study, 194 pairs of children (or adolescents) and their guardians were assessed for alcohol and drug use and other impactful factors that could be associated with adversity in children or adolescents directly or indirectly exposed to these substances.

Keywords: Child Health. Toxic Stress. Vulnerability.

[1] E-mail: ma.marianac@hotmail.com Orcid: https://orcid.org/0009-0009-0561-8129
Lattes: https://lattes.cnpq.br/0272730495305032
[2] E-mail: dudaosorio@icloud.com Orcid: https://orcid.org/0000-0001-8795-383X
Lattes: https://lattes.cnpq.br/2492298010530056
[3] E-mail: isabelaqueirozguedes@hotmail.com Orcid: https://orcid.org/0000-0003-0855-4035
Lattes: http://lattes.cnpq.br/9763754384317487
[4] E-mail: bdiegogabriel@gmail.com Orcid: https://orcid.org/0000-0002-8904-3984
Lattes: https://lattes.cnpq.br/7778206653634057
[5] E-mail: barbara.s.p@hotmail.com Orcid: https://orcid.org/0009-0004-5776-8544
Lattes: http://lattes.cnpq.br/9055020908711306
[6] E-mail: arturpmt@hotmail.com Orcid: https://orcid.org/0009-0000-2109-9183
Lattes: https://lattes.cnpq.br/9605995405967480
[7] E-mail: juliahlobo@hotmail.com Orcid: https://orcid.org/0009-0003-5250-4518
Lattes: https://lattes.cnpq.br/2370983051022798
[8] E-mail: rodrigo.custodio@baraodemaua.br Orcid: https://orcid.org/0000-0002-4814-1334
Lattes: http://lattes.cnpq.br/2102347966352424
[9] E-mail: viviane.custodio@baraodemaua.br Orcid: https://orcid.org/0000-0002-2012-7573
Lattes: http://lattes.cnpq.br/1682005626133687

RESUMO

O neurodesenvolvimento é influenciado pela interação de fatores neurológicos, biológicos e o ambiente, como educação, estímulos diários e relacionamentos familiares saudáveis. O estresse tóxico, causado por adversidades intensas e contínuas, pode prejudicar o neurodesenvolvimento. Um fator de risco para esse estresse contínuo é a disfunção familiar, especialmente o abuso de álcool e drogas pelos pais. Nesse estudo, foram avaliados 194 pares compostos por crianças (ou adolescentes) e seus responsáveis quanto ao uso de álcool e drogas e outros fatores impactantes, que poderiam estar associados a adversidades nas crianças ou adolescentes expostos direta ou indiretamente a essas substâncias.

Palavras-chave: Saúde da Criança. Estresse Tóxico. Vulnerabilidade.

RESUMEN

El desarrollo neurológico está influenciado por la interacción de factores neurológicos, biológicos y ambientales, como la educación, los estímulos diarios y las relaciones familiares saludables. El estrés tóxico, causado por adversidades intensas y continuas, puede perjudicar el desarrollo neurológico. Un factor de riesgo para este estrés continuo es la disfunción familiar, especialmente el abuso de alcohol y drogas por parte de los padres. En este estudio, se evaluó a 194 parejas compuestas por niños (o adolescentes) y sus tutores en cuanto al consumo de alcohol y drogas y otros factores impactantes, que podrían estar asociados con adversidades en los niños o adolescentes expuestos directa o indirectamente a estas sustancias.

Palabras clave: Salud Infantil. Estrés Tóxico. Vulnerabilidad.

1 INTRODUCTION

According to the book "Human Development", to understand development at the beginning of life, it is necessary to consider that each individual has inherited genetic characteristics, which are the starting points of the formation of the human being. However, modifying factors must also be identified, which are environmental, cultural and social, which complement each other in different experiences that will affect and influence the development of the child in formation (Papalia; Feldman, 2013). In the view of the authors, in fact, the very concept of childhood can be seen as a social construction.

According to a statement by the Brazilian Society of Pediatrics, "Neurodevelopment is a process that involves the interaction between neurobiological aspects and the environmental context". Thus, it exposes that children not exposed to toxic stresses, with access to education, positive daily stimuli, good family relationships and affection, usually perform better in adult, academic and occupational life (Brazilian Society of Pediatrics, 2017).

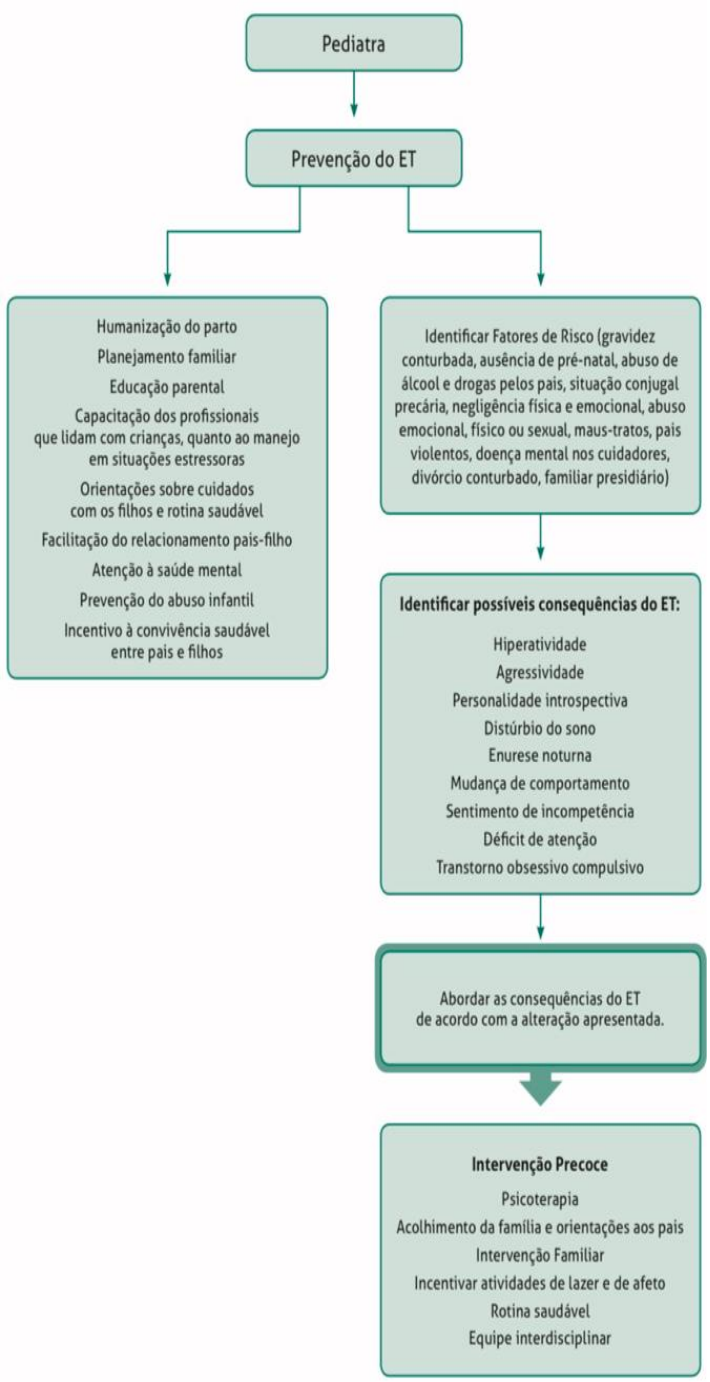
Toxic stress is characterized by continuous stress (vulnerability, adversity, or negative and traumatic experiences) and, when intense, it is associated with irreversible changes in the child's neurodevelopment (Brazilian Society of Pediatrics, 2017).

Family dysfunction is one of the risk factors for continuous stress in the household of children and adolescents and, taking into account the high prevalence of parental use of alcohol and drugs in this group, it can lead to continuous toxic stress and consequent changes in child neurodevelopment, in addition to triggering future chronic diseases, as well as neuropsychiatric disorders. (Campelo *et al*., 2018). Such consequences can be explained by prolonged exposure to these stressors and the release of cortisol, which can lead to changes in synaptic connectivity, triggering brain structural changes that would be associated with reduced brain volume, dysfunction of the neuroendocrine and limbic systems, and functional neuroplasticity (Brazilian Society of Pediatrics, 2017).

The Brazilian Society of Pediatrics published in a Guidelines Manual in 2017, recommendations for pediatricians to know how to approach and identify toxic stress (**Figure 1**).

Figure 1

Recommendations for the pediatrician's approach to the risk and intervention of toxic stress



Source: Brazilian Society of Pediatrics (2017)

Regarding the consumption of alcohol and drugs in the prenatal period, these drugs have a direct effect on the risk of complications to the fetus and the mother during pregnancy and throughout life, as they cause teratogenicity and direct effects on cell growth factors. Alcohol can also generate an increase in the incidence of miscarriage, a higher risk of infections, placental abruption, uterine hypertonia, meconium amniotic fluid, premature labor and the well-known Fetal Alcohol Syndrome (Freire *et al.*, 2005)

The use of drugs during pregnancy, such as crack, can generate several fetal malformations, genetic mutations, low birth weight, decreased head circumference, delayed neuropsychomotor development and even sudden death (Botelho *et al*., 2013).

Thus, the harmful relationship of the effects caused by the use of alcohol and drugs in the prenatal and postnatal periods, in the home environment, are ways of preventing full cognitive development and cause psychopathological effects in childhood and adolescence (Coles; Black, 2005).

Finally, it is imperative to pay attention to public health problems, according to the results published in 2019 by the World Health Organization (WHO), which points out that 14% of adolescents in the world live with mental disorders. And along with this, suicide was responsible for 1 in every 100 deaths, with 58% committed by individuals under the age of 50 (World Health Organization, 2022).

In order to act on changing this data, the Mental Health Action Plan 2013-2030 was developed, which commits to global goals and clear actions aimed at promoting mental health and well-being for all. In addition, by recognizing the relevance of environmental influences on this deficit, one of the pillars of this Action Plan is the restructuring of environments that could negatively influence mental health, including homes, communities, schools, and health services (World Health Organization, 2022).

2 OBJECTIVES

General: To identify the negative impacts of parental alcohol and drug abuse on children and adolescents in Basic Health Units in the northern zone of Ribeirão Preto -SP.

Specific: Analyze the negative factors that these children and adolescents are being exposed to by their guardians.

To relate the prevalence of drug abuse with the consumption of alcohol in the household, or in isolation by the caregivers.

Identify harmful effects on children and adolescents in a physical and psychological way.

3 MATERIALS AND METHODS

3.1 POPULATION STUDIED

The Health Units, where the project was developed, are located on the outskirts of the northern zone of the city of Ribeirão Preto, state of São Paulo: UBS Jardim Aeroporto, USF Heitor Rigon, USF Valentina Figueiredo, USF Estação do Alto, UBS Vila Mariana, UBS Simioni, UBS Dutra and UBS Ribeirão Verde. These offer medical care to this population,

also through agreements signed between the Barão de Mauá University Center and the Ribeirão Preto Health Department.

3.2 ETHICAL ASPECTS

3.2.1 Commitment and responsibilities

As this is a study with data collection in the context of Health Units, where individuals receive care, the researchers made a commitment not to change their routine, not to place them in a situation of disrespect in relation to the activities that motivated the search for the service in question and that never linked adherence to participating in the study with any form of responsibility or obligation.

Thus, the research was carried out without identifying the subjects, ensuring the preservation of their identity, and was only initiated after the acceptance to participate in the study. The data collected during the study were used only for what refers to its objectives, and the information was presented collectively, without any prejudice to the subjects involved, and there was no mention of participants' names. The data were under the custody of the principal investigator, and its secrecy and confidentiality were guaranteed.

3.2.2 Recruitment of individuals

In order to portray the reality at the time the research was developed, a study was carried out in which the influence of biological, socioeconomic and behavioral factors involved in the occurrence of parental alcohol and drug abuse and its impacts on exposed children and adolescents were simultaneously evaluated.

3.2.3 Inclusion criteria

Be in a Health Unit, be a father, mother or legal guardian of children and/or adolescents up to 18 years of age, in their own care or as a companion of children, relatives or acquaintances, have their participation in the study duly accepted by signing the Informed Consent Form (ICF) according to resolution number 510, of April 7, 2016 of the National Health Council (Brazil, 2016), related to research with human beings, with the confidentiality of identity and the use of the results only for scientific purposes being guaranteed.

3.2.4 Exclusion Criteria

Participant who at any time wants to withdraw his/her consent to participate in the study. And individuals over 18 years of age or minors not accompanied by their guardians.

3.2.5 Data collection

This research project was approved by the Research Ethics Committee (CAAE: 46888021.8.0000.5378).

Data collection was only initiated after approval by the CEP (Opinion Number: 6.747.724) of the Barão de Mauá University Center and agreement of the Municipality of Ribeirão Preto through the Health Units associated with the Barão de Mauá University Center, where the interviews were conducted.

This study was developed through standardized interviews with fathers, mothers or legal guardians of children and adolescents of both sexes from birth to 18 years of age, in their own care or as a companion of children, relatives or acquaintances, in a non-probabilistic convenience sample. Data were collected from a total of 194 patients between 2021 and 2025.

A cross-sectional and descriptive study was conducted, and each child or adolescent participates only once in the study. Recruitment was carried out in the health units, where the nature of the study was explained to the parents/guardians and the child and, if there was agreement, the signature of the free and informed consent form was signed. After signing the free and informed consent form, data collection was carried out and, for this purpose, a structured form was used, containing open and closed questions, and the technique used for the interview was individual.

To carry out the interview, the student was previously trained on how to apply and fill out the questionnaire, to minimize discomfort, being attentive to the verbal and non-verbal signs of the participant, ensuring a reserved place and freedom not to answer embarrassing questions, avoiding discrimination and stigmatization based on the content revealed.

Although the material is easy to obtain through interviews, the research participant was also informed about the discomfort of making time available to answer the form, the results of which are the sole responsibility of the researchers involved. At the end of the research, the researchers assume the commitment to communicate the results of the research in meetings and scientific events, aiming to contribute to the improvement of the health conditions of the community, preserving, however, the individual image, ensuring that the research subjects were not identified.

The expenses with the project were borne by the researchers themselves and did not receive funds from pharmaceutical laboratories.

3.2.6 Statistical analyses

The different variables collected and calculated for each child or adolescent studied were entered into a Microsoft Excel 2000® spreadsheet.

To compare the results of quantitative variables between two groups, Student's t-test (Siegel; Castellan Jr, 1988). In the comparisons of the frequencies of different qualitative variables, the chi-square test was used (Fleiss, 1981).

The degree of statistical significance was set at 5% ($p \leq 0.05$)

In the comparisons of the frequencies of the different qualitative variables, Fisher's Exact Test (FLEISS, 1981) was used. The significance level (p) was lower than or equal to 0.05.

3.3 CONFLICT OF INTEREST

This article was published in the ANAIS of ENIC of the Barão de Mauá University Center, this being a conclusion work of the Scientific Initiation Project started in 2024 and ended in 2025.

4 RESULTS

During the study, 194 children and adolescents were analyzed, in Basic Health Units in the North Zone of the municipality of Ribeirão Preto, between the years 2021 and 2024. The analyzed patients were under 18 years of age (minimum age of 6 months), with a median age of 71 months and accompanied by their guardians during the interview.

The age of the guardians ranged from 17 to 74 years (median age of the guardians: 33 years).

In addition, 124 of the total number of patients had one or more siblings living in their household (70 of the patients were described as the only child and adolescent living in the household).

Another data obtained in the analysis was that only 6 of the children and adolescents live with only 1 guardian, in contrast, 188 children and adolescents, the vast majority of whom were studied, live with more than one guardian.

Regarding the guardians of these patients analyzed, 146 live with their partners, and 76 partners who are parents of these children are described. And only 18 guardians live only with their children or with other members, not characterized as partners.

Finally, the average number of residents per household was 3.96 and the average number of children per household was 2.17.

Table 1 compares the parental use of alcoholic beverages with the abusive use at home, which was characterized as the consumption of alcohol more than once a week within the household where the child and/or adolescent lives, with the use being made by another resident.

The statistical analysis showed that 19% of the parents or guardians ingest alcoholic beverages, totaling 37 guardians studied.

Of these, 12 parents or guardians reported that, in addition to them, other residents of the same residence as the child or adolescent had abusive use of alcoholic beverages (which in the study considered as abuse the consumption of alcoholic beverages more than once a week, in this case within the home).

The other caregivers, 157 of those studied, did not report consuming alcoholic beverages. However, among them, 14 reported that other residents of the residence where the child lives abuse alcohol at home.

Thus, a p-value of 0.0006 was obtained, finding significance by the exact value of Fisher's test.

This occurs because most of the studied do not use alcoholic beverages or abuse alcohol at home, that is, 143 of them. However, among those who use alcoholic beverages, we found a significant number of parents or guardians who reported that there are people who abuse alcohol in their homes.

Thus, we can observe that in addition to those responsible for these children, other residents can be contributors by exposing them to negative environments for healthy growth physically and psychologically.

5 DISCUSSION

Table 1

Parental use of alcoholic beverages and abusive use of alcohol at home

Use of alcoholic beverages	Alcohol abuse in the home	No alcohol abuse in the home	Total
Yes	12	25	37
No	14	143	157

Source: Authors.

Table 2 analyzes the relationship between the use of alcoholic beverages by the caregivers and the use of sleeping medications by them (which in the study included those who used benzodiazepines to sleep).

Among the 37 patients studied who use alcoholic beverages, only 1 patient reported daily use of benzodiazepines to sleep.

In this case, a p value of 0.2052 was obtained, so there was no statistical difference. Since only 1 of the 37 patients who drink alcoholic beverages use benzodiazepines to sleep. Having a greater number of patients who do not use alcoholic beverages and also do not use sleeping pills, being 140 patients.

Thus, in this study, there was no significant correlation between the use of alcoholic beverages and the use of sleeping pills by their parents/guardians.

Table 2

Use of alcoholic beverages and use of sleeping pills by those responsible for them

Use of alcoholic beverages	Use of sleeping pills	No use of sleeping pills	Total
Yes	1	36	37
No	17	140	157

Source: Authors.

Table 3 analyzes the relationship between the use of alcoholic beverages by the parents or guardians and the presence of financial aid from the government for this family.

In this case, 13 patients, out of 37, used alcoholic beverages and also received financial help from the government. Thus, a p value of 1.0 was obtained, which was not significant when compared to those who do not consume alcoholic beverages, of which a considerable portion of these also receive financial aid from the government (57 patients).

Table 3

Alcohol use and government financial aid

Use of alcoholic beverages	Government financial aid	No financial help from the government	Total
Yes	13	24	37
No	57	100	157

Source: Authors.

Table 4 analyzes the relationship between the caregivers who used alcoholic beverages and also used marijuana concomitantly. In this case, among the 37 patients, 6 used marijuana. In addition, among the majority of the patients studied who were those who did not report using alcoholic beverages, of the 157 patients, we found only 5 who used marijuana and 152 did not use marijuana.

As a result, it was obtained that even though the minority of those studied do not consume alcohol, it is from this group that we find most of the patients who use marijuana.

It was thus possible to relate that the use of alcoholic beverages is a risk factor for the responsible person to use an illicit drug such as marijuana. It is considered that if a larger sample of subjects were obtained, there would be an even greater number of people who use alcohol concomitantly with the use of marijuana.

In this analysis, a p value of 0.0073 was obtained, finding statistical significance when relating the consumption of alcohol by the parents or guardians with the concomitant consumption of marijuana by them.

This makes us argue that, in addition to these children being exposed to guardians who use alcohol, they can often be exposed to illicit drugs such as marijuana. It can even more impact their development as a child, adolescent and future adult, once exposed to negative factors and traumatic experiences in the home environment and in their family environment.

Table 4

Use of alcoholic beverages with concomitant use of marijuana

Use of alcoholic beverages	Concomitant marijuana	No concomitant marijuana	Total
Yes	6	31	37
No	5	152	157

Source: Authors.

Table 5 analyzes the relationship between alcohol use and cocaine use by the parents/guardians.

Finding only one guardian who used concomitantly and of the guardians who did not report the consumption of alcoholic beverages, 5 of them use isolated cocaine and 152 do not use any of these substances.

Thus, it obtained a p value of 1.0, which did not find significance when studying this concomitant use of alcohol and cocaine by the parents/guardians.

There was a greater number of parents or guardians who did not use any of the substances and a portion of those who did not use alcohol who reported using only cocaine, being even higher than those in the group who used alcohol.

Table 5

Use of alcoholic beverages with the use of combined cocaine

Use of alcoholic beverages	Combinant cocaine	No use of combinant cocaine	Total
Yes	1	36	37
No	5	152	157

Source: Authors.

Table 6 shows that the use of alcoholic beverages was related to the attempt to self-exterminate the parents or other family members. 4 attempts at self-extermination were described among the group of those who reported alcohol consumption. Since these 4 patients were responsible, 2 were responsible for the children and adolescents interviewed and another 2 family members who were not described as responsible.

The methods used as a form of self-extermination included: 2 reports of hanging, 1 report of a knife and 1 report of precipitation in front of a moving vehicle.

Thus, a p value of 0.2478 was found, and no statistical significance was observed when relating the use of alcoholic beverages with the attempt at self-extermination.

Table 6

Use of alcoholic beverages with attempted self-extermination

Use of alcoholic beverages	Attempted self-extermination	No attempt at self-extermination	Total
Yes	4	33	37
No	8	149	157

Source: Authors.

Table 7 smooths out the relationship between the use of alcoholic beverages by the parents or guardians and the need for psychological follow-up by the children and adolescents studied.

It was observed that among the 37 caregivers who consume alcohol, 5 of them report that their children are monitored by a psychologist. The pathologies spontaneously mentioned: stress, depression in two of these children and adolescents and sexual abuse (p=0.20).

In addition, none of these children used or required the use of controlled drugs (p=0.21), and none of these five patients studied had no reports of attempted self-extermination.

Thus, a p value of 0.5774 was found, and no significance was found in the analysis. Which ends up being a negative factor for these children and adolescents, once exposed to

an environment with negative and possibly traumatic factors. It would be of great importance to have a higher rate of psychological follow-up from childhood, so that it does not bring greater harm to their psychic and psychosocial development.

Table 7

Use of alcoholic beverages and psychological follow-up of children and adolescents

Use of alcoholic beverages	Psychological support	No psychological support	Total
Yes	5	32	37
No	17	140	157

Source: Authors.

Table 8 analyzes the use of alcoholic beverages with the history of sexual abuse suffered by the children and adolescents studied.

2 reports were found in both groups, in which the parents or guardians use alcoholic beverages and in the group in which the guardians do not use alcohol.

Finding a p value of 0.2115 and thus indicating the absence of statistical significance when relating these two factors in the study.

Since the same number of patients was obtained in both groups, this association could be better investigated if we obtained a greater number of patients in the study, in which we would possibly find more cases of abuse in the group that uses alcoholic beverages, since in these studies we only found a sample of 37 patients.

Table 8

Use of alcoholic beverages with a history of sexual abuse in children and adolescents

Use of alcoholic beverages	Sexual abuse	No sexual abuse	Total
Yes	2	35	37
No	2	155	157

Source: Authors.

Table 9 shows that the use of alcoholic beverages was related to the concomitant use of drugs with a depressant action on the Central Nervous System (CNS).

In this analysis, no cases of use of drugs used with CNS action were reported in the group of caregivers who use drugs that depress the central nervous system. The analysis

found a p value of 1.0, and did not obtain significance when relating these groups to this factor.

Table 9

Use of alcoholic beverages is with the use of drugs that act on the Central Nervous System (CNS)

Use of alcoholic beverages	Use of medications with action on the CNS	No use of CNS drugs	Total
Yes	0	32	37
No	9	140	157

Source: Authors.

Table 10 shows the psychological follow-up carried out by the child and adolescent, including the group in which the parents or guardians use alcoholic beverages and the group in which the parents or guardians do not consume, relating it to the report of sexual abuse of these children and adolescents.

It was found that, within the total of 194 patients studied in this study, 22 children and adolescents undergo psychological counseling. Among these 22 children, 4 are monitored by a psychologist and suffered sexual abuse and 18 of them are undergoing psychological follow-up, but have not suffered sexual abuse.

Showing in the study that the smallest part of these children who are monitored by a psychologist have suffered sexual abuse. In addition, analyzing Table 6 as a whole, we observed that among the total number of patients studied who reported suffering sexual abuse, 4 of whom were children and adolescents, 4 patients underwent psychological counseling. Thus, psychological counseling can be interpreted as a protective factor for these children and adolescents, considering that they were exposed to a crime of high traumatic potential. Such situations demand, essentially, adequate psychological support, especially in such a sensitive phase of development.

Finally, a p value of 0.21 was obtained from this analysis, which did not find significance when comparing the total group that is monitored by a psychologist from the groups of guardians who use or do not use alcoholic beverages, with the occurrence of sexual abuse.

Table 10

Psychological follow-ups with or without the use of alcoholic beverages associated with a history of sexual abuse in children and adolescents

Psychological follow-ups	Sexual abuse	No sexual abuse	Total
With the use of alcoholic beverages	2	3	5
No alcohol	2	15	17

Source: Authors.

Discussing the analysis of the data made in the tables, it revealed that the consumption of alcoholic beverages by the parents or guardians is associated with the concomitant use of marijuana and alcohol abuse in the household. However, other variables analyzed did not show a significant correlation with alcohol consumption.

Thus, it should be emphasized that, in general, the consumption of alcohol by guardians can seriously harm the development of children, creating an unstable family environment and exposing them to risky behaviors, such as abuse and neglect. This affects their emotional, cognitive, and physical well-being, increasing vulnerability to psychological problems.

As for the children exposed to these guardians, it was observed that most were not receiving psychological counseling, although these guardians were aware of the abuse suffered.

These findings suggest that, although some risk factors have been identified, the limited sample may have influenced the observed associations. Further studies with larger sample sizes are needed to deepen the understanding of the dynamics between these factors.

6 CONCLUSION

From the analysis of all the data discussed, it is concluded that among the studied caregivers who reported using alcoholic beverages, there was significance with the use of concomitant marijuana, as well as the abusive use (more than once a week) of alcohol in the household.

In addition, other variables related to caregivers who use alcoholic beverages were studied, in which they did not show an association, such as: receipt of financial aid from the government, use of cocaine, use of drugs with action on the Central Nervous System (CNS),

use of sleeping medications (benzodiazepines) and attempted self-extermination. Children exposed to these guardians who consume alcoholic beverages were also analyzed, analyzing those who undergo psychological counseling and also those who reported sexual abuse. In addition, it was often observed that if a larger sample of patients were reached and in a broader population and territorial area, we could find greater impacts on the resulting data.

Finally, it is evident that prevention and guidance are essential activities to promote health and responsibility within the family environment, directly impacting the healthy development of children and adolescents. It is essential, therefore, to seek new tools that help health professionals to identify children living in at-risk environments early and provide adequate support, both for them and for their families. In addition, it is the responsibility of parents or guardians to limit children's exposure to toxic substances, which can harm both children's physical and psychological health.

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