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ORIGINAL ARTICLE

Factors associated with intentionally self-inflicted injuries in adolescents from Mato Grosso, Brazil

Fatores associados às lesões autoprovocadas intencionalmente em adolescentes de Mato Grosso, Brasil

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ABSTRACT The objective was to investigate the clustering patterns of sociodemographic characteristics and the main means used in intentional self-harm in adolescents living in Mato Grosso. A descriptive study that analyzed the cases of self-harm reported by the Violence and Accident Surveillance System, specifically its component on the surveillance of interpersonal and self-inflicted violence within the Notifiable Diseases Information System, from 2011 to 2020. The relationship between the studied variables was assessed by multiple correspondence analysis. There were 1,421 reports of self-harm in adolescents, and the most used means were poisoning (51.6%), sharp objects (28.4%), and hanging (9.8%). Distinct patterns were observed: 1) male gender, self-harm occurred in public spaces, by means of sharp objects or hanging; 2) adolescents aged 10 to 14, asian race/color, who attended elementary school, self-harm occurred at school; 3) adolescents aged 15 to 19, female, black/brown or white, with high school or higher education, married or in a stable union and with a disability/disorder, which occurred at home and poisoning. Identifying patterns between the means used in intentional self-harm and the characteristics of adolescents allows planning more effective actions to prevent these events in this population.

KEYWORDS Self-harm. Adolescent. Disease notification. Multivariate analysis.

RESUMO *O objetivo foi investigar os padrões de agrupamentos de características sociodemográficas e os principais meios utilizados nas lesões autoprovocadas intencionalmente em adolescentes residentes em Mato Grosso. Estudo descritivo que analisou os casos de lesões autoprovocadas notificados pelo Sistema de Vigilância de Violências e Acidentes, em seu componente Vigilância de violência interpessoal e autoprovocada do Sistema de Informação de Agravos de Notificação, no período de 2011 a 2020. A relação entre as variáveis estudadas foi avaliada pela análise de correspondência múltipla. Foram 1.421 notificações de lesões autoprovocadas em adolescentes, e os meios mais utilizados foram envenenamento (51,6%), objeto perfurocortante (28,4%) e enforcamento (9,8%). Observou-se distintos padrões: 1) sexo masculino, autolesão ocorrida em via pública, por meio de objetos perfurocortantes ou enforcamento; 2) adolescentes de 10 a 14 anos, raça/cor amarela, que frequentavam o ensino fundamental, autolesão ocorrida na escola; 3) adolescentes de 15 a 19 anos, sexo feminino, raça/cor parda/preta ou branca, ensino médio ou superior, casadas ou em união estável e com deficiência/transtorno, ocorrida na residência e envenenamento. A identificação de padrões entre o meio utilizado nas lesões autoprovocadas intencionalmente e as características dos adolescentes permite planejar ações mais efetivas para a prevenção desses eventos nesta população.*

PALAVRAS-CHAVE *Autolesão. Adolescente. Doenças e agravos de notificação compulsória. Análise multivariada.*

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Introduction

Intentional self-inflicted injuries represent a major public health problem. They are important predictors of suicide, which is the second leading cause of death among adolescents aged 15-19 years[1] and has shown an increasing trend in recent years[2]. Research on intentional self-inflicted injuries has been increasing and has highlighted their multicausal nature, identifying risks, protective factors, and recognition of cultural differences across regions[3].

The World Health Organization (WHO) defines intentional self-inflicted injury as violence that a person inflicts upon themselves. Specifically, this includes behaviors such as suicidal behavior, self-harm behavior, self-injury, or self-abuse, regardless of the degree of lethal intent[3]. However, scholars and health professionals find it challenging to delineate the self-inflicted injury conceptually, due to the wide range of behaviors that harm oneself and, often, the lack of evidence about whether the act was intended to end one's life.

Adolescence is described as a transitional phase between childhood and youth, determined by each society's cultural expectations. It entails significant physiological (hormonal changes at puberty) and psychosocial changes. The exact endpoint of adolescence is intensely debated, making difficult to precisely define this population group[4-6]. This transition is a critical period for risks and vulnerabilities related to violence. Importantly, adolescence is not a natural determination but rather a historical and social construction shaped by social and institutional violence[7,8].

In Brazil, beyond the Statute of the Child and Adolescent (ECA)[9], published in 1990 aiming at comprehensive protection of children and adolescents and guaranteeing their rights, other more recent legal and normative instruments seek to curb and prevent violence in this population, such as the Ten-Year Plan for the Human Rights of Children and Adolescents (2011–2021)[10] and the Comprehensive Protection Program for Children and Adolescents, among others[11]. Additionally, Law Nº13.431 of April 4, 2017, established the System for the Guarantee of Rights of Children and Adolescents (SGDCA) victims or witnesses of violence, which aims to reduce revictimization of this population or institutional violence exerted against them through guidance and implementation of specialized listening within SGDCA network points[12].

In the health sector, the Brazilian Unified Health System (SUS) is expected to ensure the right to life and health of this population through comprehensive health care, which consists, among other strategies, of avoiding situations of human rights violations, preventing violence, and promoting psychosocial care for adolescents[13]. In this regard, we should highlight the recent establishment of the National Policy for Comprehensive Health Care of Adolescents and Youth (PNAISAJ), which advocates the organization, implementation, and qualification of adolescent and youth health care, emphasizing comprehensiveness, interdisciplinarity, and intersectorality, ensuring access to health, prioritizing vulnerable groups, and promoting humanized and inclusive care[14].

Particularly regarding self-inflicted injuries, in 2006 the Brazilian Ministry of Health established the National Suicide Prevention Guidelines[15], considering, among other factors, the increasing suicidal behavior frequency; the impact and damage caused by attempts in families, workplaces, schools, and other institutions; the importance of recording cases; and the possible intervention in suicide attempts[15]. More recently, the Strategic Actions Agenda for Suicide Surveillance and Prevention and Health Promotion[16] and the National Policy for the Prevention of Self-harm and Suicide[17] were established as permanent governmental strategies for preventing these events and treating associated determinants.

Epidemiological data on intentional self-inflicted injuries diverge and vary in the literature. This situation is influenced by

research methodology and especially by the population studied. Different cultures address the same event distinctly. However, scholars agree that this event is growing in contemporary times, particularly among youth and adolescents[18–20]. A recent study shows that the reporting rate of intentional self-inflicted injuries among Brazilian adolescents increased significantly between 2009 and 2016. It rose from 2.1/100,000 to 25.7/100,000 individuals[19].

Besides the predominance of females reported by several authors[18,21,22], poisoning has been identified as the most frequently used method in intentional self-inflicted injuries among Brazilian adolescents, usually occurring at home[19,23,24], with growth observed in most Brazilian regions, particularly among males in the Midwest (54.4%)[19]. Regarding age group, Luis et al.[25] found higher prevalence of self-inflicted injuries among older adolescents (18–19 years) compared to younger adolescents (10–12 years), 4.03 times higher among males. Among younger adolescents, self-inflicted injuries involving sharps were most frequent[24,25].

Despite the increasing frequency of intentional self-inflicted injuries among Brazilian adolescents in recent years, investigations on the topic remain scarce[1,26]. This situation also occurs in the state of Mato Grosso[27], although the literature reveals high suicide mortality rates in the state[28–30]. Recent Ministry of Health data show approximately 148% growth in notifications of self-inflicted injuries in the Mato Grosso population between 2018 and 2022, while among adolescents growth reached 184.1%[31].

Self-inflicted injury, even without evidence of suicidal intent, is typical of adolescence and tends to decrease in adulthood[32]. However, it is essential to investigate cases of self-inflicted injuries in this age group, considering that this is an important indicator of distress. Self-inflicted injuries may deteriorate due to the idea that taking one's own life could resolve such distress and subsequently lead to completed suicide[33,34].

Monitoring self-inflicted injuries enables the adoption of protective measures for victims. In this context, the Violence and Accident Surveillance System (VIVA), in its component Surveillance of interpersonal and self-inflicted violence within the Notifiable Diseases Information System (VIVA-SINAN), is a relevant source of information and has been a fundamental tool for knowledge and visibility of violence, particularly self-inflicted injuries, supporting public policies and triggering strategies to reduce these conditions[35].

Given the relevance of expanding knowledge about intentional self-inflicted injuries among adolescents in Mato Grosso and promoting actions for prevention of these conditions, this study aimed to investigate clustering patterns of sociodemographic characteristics and the main methods used in intentional self-inflicted injuries among adolescents residing in Mato Grosso.

Material and methods

This descriptive and exploratory study analyzed reported cases of intentional self-inflicted injuries among adolescents (10 to 19 years) residing in Mato Grosso from 2011 to 2020. This time frame was defined because mandatory notification of self-inflicted violence by all health units began only in 2011[21]. Notably, this study investigated all reported cases, regardless of suicidal intent.

We adopted secondary data available in VIVA, specifically its VIVA-SINAN component, retrieved from a database provided by the Mato Grosso State Health Secretariat (SES-MT). Intentional self-inflicted injury cases are reported through completion of the interpersonal/self-inflicted violence notification form[36].

Initially, the database included 7,072 notifications of intentional self-inflicted injuries (1,595) and interpersonal violence (5,477). After checking inconsistencies by verifying some fields of the notification form, we

excluded cases of interpersonal violence and sequelae incorrectly recorded as self-inflicted injuries, resulting in 1,421 notifications analyzed in this study.

Sociodemographic variables were gender (female; male); age group (10–14 years; 15–19 years); race/color (white; black/brown; asian; indigenous); schooling (elementary; high school; higher education); marital status (single/separated; married/common-law marriage); disability or disorder (yes; no); and place of occurrence (home; school; public road; and other). Methods used were hanging (yes; no); use of sharps (yes; no); poisoning (yes; no) and they represented the most frequent methods, accounting for 87.5% of records.

Absolute and relative frequency measures were calculated for the studied variables. We employed Pearson's chi-square test to compare proportions of methods by sociodemographic characteristic.

We used multiple correspondence analysis to identify clustering patterns among sociodemographic variables and methods used. This statistical technique detects correspondence and offers a graphical view of the variables most relevant to the set[37]. It is also helps evaluate categorical variables quickly and reliably[38].

For correspondence analysis, we selected sociodemographic variables with p-value ≤0.10 in bivariate analysis with any method. The selected variables were arranged in rows and columns in a contingency table, indicating the Correspondence Matrix, Row Profile Matrix, and Column Profile Matrix. After identifying the matrix, we proceeded to singular value decomposition, identified as principal coordinates of columns and rows, comparing expected and observed values, thus enabling combination of variables and their associations. After obtaining principal coordinates, we built a scatter plot with coordinates, termed correspondence plot[38]. The indigenous race/color category was excluded due to low frequency (n=23; 1.7%) and influence on category relevance[39], given specificities of the Indigenous population[16]. We performed analyses using Stata version 16 and Excel® version 2010, and adopted 5% significance level.

This research followed guidelines established in Resolution Nº510/2016 of the National Health Council, which provides human research standards[40]. The Research Ethics Committee of the Federal University of Mato Grosso approved the study under Certificate of Presentation for Ethical Appreciation (CAAE) Nº45860621.6.0000.8124 and Approval Opinion Nº4.858.500.

Results

From 2011 to 2020, 1,421 notifications of intentional self-inflicted injuries among adolescents were reported in Mato Grosso, with mostly females (75%), aged 15–19 years (75.4%), black/brown (62.6%), single (90.6%), high school education (54.6%), and without disability or disorder (69%). The most frequent place of occurrence was the home (88.8%). Regarding methods used, 51.6% involved poisoning, 28.4% use of sharps, and 9.8% hanging (*table 1*).

Table 1. Distribution of sociodemographic characteristics and means used in intentionally self-inflicted injuries in adolescents. Mato Grosso, Brazil, 2011-2020

Variables	**n (%)**
Gender	**n = 1421**
Female	1,066 (75.0)
Male	355 (25.0)
Age group (years)	**n = 1421**
15-19	1,072 (75.4)
10-14	349 (24.6)
Race/color	**n = 1355**
Black/brown	848 (62.6)
White	468 (34.5)
Indigenous	23 (1.7)
Asian	16 (1.2)
Schooling	**n = 1125**
Elementary	464 (41.2)
High School	614 (54.6)
Higher Education	47 (4.2)
Marital status	**n = 1275**
Single	1,155 (90.6)
Married/Common-law marriage	120 (9.4)
Disability or disorder	**n = 1231**
Yes	381 (31.0)
No	850 (69.0)
Place of occurrence	**n = 1383**
Home	1,228 (88.8)
Public road	56 (4.0)
School	39 (2.8)
Other	60 (4.4)
Hanging	**n = 1373**
Yes	135 (9.8)
No	1,238 (90.7)
Sharps	**n = 1377**
Yes	391 (28.4)
No	986 (71.6)
Poisoning	**n = 1388**
Yes	717 (51.7)
No	671 (48.3)

Source: Prepared by the authors.

Table 2 presents methods used for self-inflicted injury by sociodemographic characteristics. Gender analysis revealed significant differences in proportions of hanging (18.4% males; 6.9% females) and poisoning (37.5% males; 56.4% females). Regarding age group,

use of sharps was most frequent among those aged 10–14 years (p=0.004), while poisoning accounted for 55.8% (p=0.005) among those aged 15–19 years.

Table 2. Sociodemographic characteristics of reported cases of intentionally self-inflicted injuries in adolescents according to the means used. Mato Grosso, Brazil, 2011-2020

	Hanging n = 1373		Sharps n = 1377		Poisoning n = 1388	
Variables	**n(%)**	**p-value**	**n(%)**	**p-value**	**n(%)**	**p-value**
Gender	**n = 1373**	**< 0.001**	**n = 1377**	**0.179**	**n = 1388**	**< 0.001**
Female	71 (6.9)		283 (27.4)		586 (56.4)	
Male	64 (18.4)		108 (31.2)		131 (37.5)	
Age group (years)	**n = 1373**	**0.326**	**n = 1377**	**0.004**	**n = 1388**	**0.005**
15 a 19	107 (10.3)		276 (26.4)		565 (55.8)	
10 a 14	28 (8.4)		115 (34.5)		152 (45.0)	
Ethnicity/skin color	**n = 1311**	**< 0.001**	**n = 1311**	**0.004**	**n = 1324**	**0.001**
Black/brown	74 (9.1)		244 (29.9)		416 (50.2)	
White	40 (8.8)		124 (27.1)		247 (53.9)	
Indigenous	18 (78.2)		1 (4.5)		2 (9.1)	
Yellow	1 (6.2)		9 (56.2)		8 (50.0)	
Schooling	**n = 1094**	**0.850**	**n = 1097**	**0.102**	**n = 1101**	**0.021**
Elementary	46 (10.2)		150 (33.2)		213 (46.9)	
High School	55 (9.2)		166 (27.6)		322 (53.5)	
Higher Education	4 (8.9)		11 (24.4)		29 (64.4)	
Marital status	**n = 1241**	**0.332**	**n = 1245**	**0.061**	**n = 1252**	**0.213**
Single	112 (9.9)		334 (29.6)		566 (49.9)	
Married/Common-law marriage	15 (12.8)		25 (21.3)		66 (55.9)	
Disability or disorder	**n = 1199**	**0.886**	**n = 1202**	**< 0.001**	**n = 1204**	**0.001**
Yes	37 (10.0)		155 (41.9)		153 (41.4)	
No	81 (9.7)		206 (24.7)		436 (52.2)	
Place of occurrence	**n = 1340**	**< 0.001**	**n = 1345**	**0.137**	**n = 1353**	**< 0.001**
School	4 (11.1)		16 (44.4)		14 (37.8)	
Home	105 (8.8)		331 (27.6)		661 (54.8)	
Public road	3 (5.4)		14 (25.4)		8 (14.5)	
Other	20 (35.7)		18 (32.1)		14 (25.0)	

Source: Prepared by the authors.

Hanging corresponded to 78.2% of reported cases among Indigenous individuals. Poisoning was the most frequently used method for White and Black/brown adolescents, exceeding 50% of notifications (p=0.001). Statistical significance was also observed for use of sharps, and 56.2% of notifications were identified (p=0.004) among Asians.

Regarding schooling, poisoning was associated (p=0.021) among cases with higher education. It was also associated with no

disability or disorder (52.2%); conversely, use of sharps was higher among those with disabilities or disorders (41.9%). Regarding place of occurrence, the home stood out for poisoning (54.8%) as self-inflicted injury.

Considering absolute contributions of each variable to each dimension (*table 3*), the first dimension was mainly composed of sharps, poisoning, race/color, marital status, disability or disorder, and school and the home as place of occurrence. Variables contributing most to the second dimension were age group, gender, hanging, schooling, public road, and other locations. Correspondence analysis showed that the first two dimensions explained 23.53% of total data variability (Dimension 1=12.85% and Dimension 2=10.68%).

Table 3. Distribution of absolute and relative contributions of correspondence analysis for the first two dimensions

	Dimension 1		Dimension 2	
Variables	**Absolute**	**Relative**	**Absolute**	**Relative**
Age group (years)				
15-19	0.013	0.244	0.026	0.444
Up to 14	0.045	0.244	0.089	0.444
Gender				
Female	0.002	0.043	0.018	0.285
Male	0.008	0.043	0.056	0.285
Sharps				
No	0.031	0.426	0.002	0.029
Yes	0.069	0.426	0.005	0.029
Hanging				
No	0.001	0.052	0.002	0.100
Yes	0.011	0.052	0.023	0.100
Poisoning				
No	0.066	0.546	0.013	0.101
Yes	0.063	0.546	0.013	0.101
Ethnicity/skin color				
White	0.003	0.021	0.001	0.003
Black/brown	0.001	0.012	0.001	0.008
Yellow	0.004	0.018	0.005	0.019
Schooling				
Elementary	0.035	0.237	0.045	0.279
High School	0.019	0.185	0.024	0.216
Higher Education	0.003	0.015	0.005	0.018

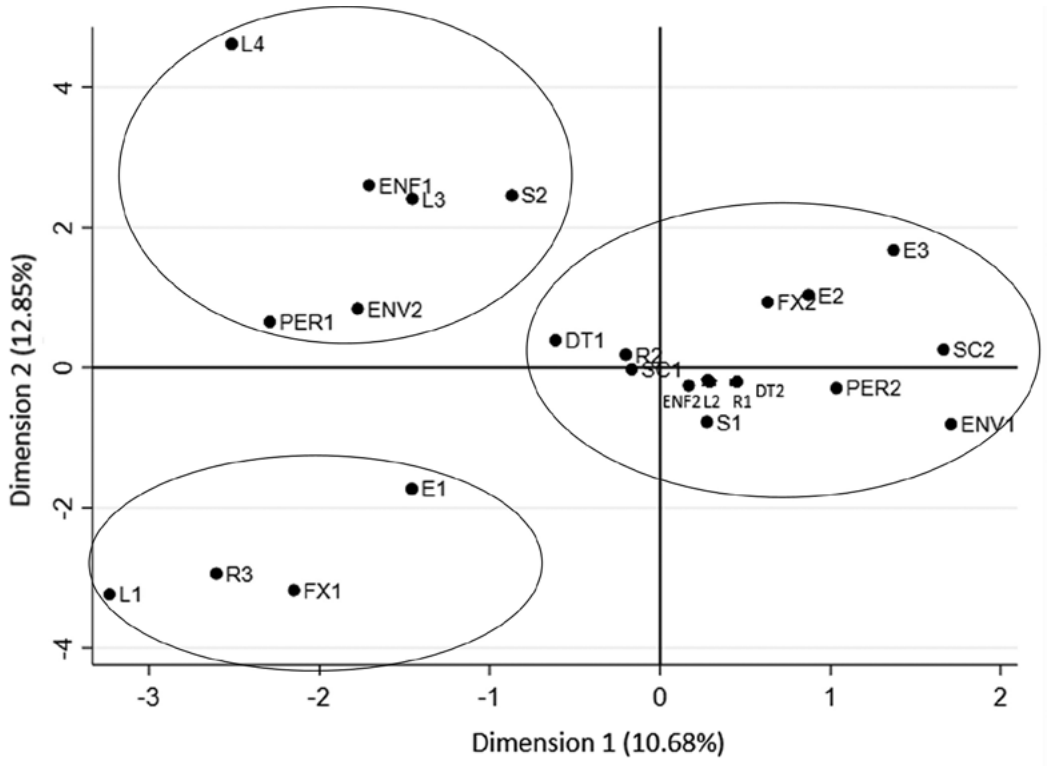
Table 3. Distribution of absolute and relative contributions of correspondence analysis for the first two dimensions

	Dimension 1		Dimension 2	
Variables	**Absolute**	**Relative**	**Absolute**	**Relative**
Marital status				
Single	0.001	0.050	0.000	0.001
Married/Common-law marriage	0.011	0.050	0.000	0.001
Disability or disorder				
No	0.002	0.031	0.001	0.010
Yes	0.005	0.031	0.002	0.010
Place of occurrence				
School	0.014	0.059	0.012	0.049
Home	0.003	0.123	0.002	0.053
Public road	0.004	0.016	0.009	0.035
Other	0.011	0.049	0.034	0.138

Source: Prepared by the authors.

Three clustering patterns were identified and can be observed in *graph 1*: upper left quadrant – male, public road occurrence, hanging and sharps; lower left quadrant – 10–14 years, elementary education, occurrence at school, asian; right quadrant – female, 15–19 years, white or black/brown, high school or higher education, married/common-law marriage, occurrence at home, disability/disorder, and poisoning.

Graph 1. Categories of self-harm groups and sociodemographic characteristics of adolescents resulting from correspondence analysis for the first two dimensions. Mato Grosso, Brazil, 2011-2020



Legend:

DT1 – Disability or disorder: Yes
DT2 – Disability or disorder: No
E1 – Education: Elementary
E2 – Education: High School
E3 – Education: Higher Education
ENF1 – Hanging: Yes
ENF2 – Hanging: No
ENV1 – Poisoning: Yes
ENV2 – Poisoning: No
FX1 – Age range: Up to 14 years
FX2 – Age range: 15 to 19 years
L1 – Place of occurrence: School
L2 – Place of occurrence: Home
L3 – Place of occurrence: Public Road
L4 – Place of occurrence: Other
PER1 – Sharps injury: Yes
PER2 – PER2 - Sharps injury: No
R1 – Ethnicity/Skin color: White
R2 – Ethnicity/Skin color: Black/Brown
R3 – Ethnicity/Skin color: Yellow
S1 – Gender: Female
S2 – Gender: Male
SC1- Marital status: Single
SC2- Marital status: Married/Common-law marriage

Source: Prepared by the authors.

Discussion

Multiple correspondence analysis identified three clustering patterns among methods used and sociodemographic characteristics of adolescents with intentional self-inflicted injuries in Mato Grosso (2011–2020). The first comprised male adolescents, regardless of age, who self-injured on public roads, used sharps or hanging. The second comprised adolescents aged 10–14 years, asian, attending elementary school who self-injured at school. The third comprised female adolescents aged 15–19 years, black/brown or white, attending high school or higher education, married or in common-law marriage, with some disability or disorder, in which the home was the occurrence site and poisoning the method used.

Gender-related findings align with national and international literature indicating that males tend to use more lethal methods such as sharps and hanging, whereas poisoning predominates among females[19,24,41-43]. Regarding age group, similar patterns were observed, with sharps use among younger adolescents (10–14 years) and poisoning among those aged 15–19 years, also reflected in findings related to schooling[19,20,44].

Literature[3,19] indicates that methods vary by culture and availability. Association between sharps use and repeated self-inflicted injury is characterized as compulsive self-inflicted injury and manifests through severe skin cuts, but may also involve scratching or picking skin until wounds form or compulsive hair pulling[45]. Visible body marks may also be potential for group and community integration of self-inflicted injury[46]. Other studies show that youth engaged in compulsive self-inflicted injuries often use multiple methods[42,47].

Race/color is considered a social determinant of health and may be linked to different vulnerabilities. Distress-generating factors such as rejection, neglect, maltreatment, abuse, violence, inadequacy, loneliness, social isolation, feelings of inferiority, and lack of belonging are associated with Blacks in situations of intentional self-inflicted injuries[48-50]. Structural and institutional racism[51,52] are also cited as risk factors, exposing adolescents to racial stigma and injustices resulting from racial violence, producing greater vulnerability to psychological disorders[51-53].

Regarding the place of occurrence, several authors[24,25,47] indicate predominance of self-inflicted injuries at home, considering availability of products that can cause poisoning, particularly medications. Results corroborate those of Luis et al.[25], who researched the factors associated with self-inflicted injuries in Espírito Santo from 2011 to 2018 and associated ease of access and moments of solitude enabling uninterrupted self-inflicted injury. Another study in Goiás identified women self-injuring at home via poisoning; however, those without partners predominated, differing from present findings showing adolescents in common-law marriage or marriage[48].

The fact that school was the site of self-inflicted injury among elementary students draws attention, as this clustering may indicate failures in implementing intersectoral child protection guidelines established in the National Plan for Confronting Violence against Children and Adolescents[54], particularly regarding integration of actions and professional development strategies across protection networks and because educational institutions, alongside other sectors of the network, must implement violence prevention programs and monitor violence situations[10-12,17].

We should highlight the role of schools in identifying and recording self-inflicted injuries and compulsory notification to health authorities[55]. Recently, notification to the Child Protection Council was also mandated for cases of violence within educational institutions, particularly self-harm, attempted suicides, and completed suicides[17].

Individuals engaging in self-inflicted injuries, even without intent to die, are subject to suicidal ideation and thoughts of death, especially when affected by mental disorders such as depression, post-traumatic stress disorder, borderline disorder, and substance abuse[32,46,56]. The act is linked to attempts to reduce anxiety, tension, and hard-to-manage emotions[19,24,46]. Some authors[57-59] argue populations intending death should be evaluated separately from those seeking relief; nevertheless, any suicidal behavior reflects a mental health problem.

The results reinforce that self-inflicted injuries are a complex and multidimensional event determined by factors operating at individual, relational, community, and macro-social levels, including fragile family bonds, socioeconomic inequalities, and inequities in access to health services, shaping individual and group vulnerabilities. In a meta-analysis review on social determinants of suicide outcomes, Na et al.[60] showed school connectedness exerts

significant protective effect against attempts and ideation, highlighting social environments' role. Understanding this event from this perspective implies recognizing that occurrence and response cannot be reduced to isolated health interventions but require improved living conditions, dignity, income, housing, social cohesion, and comprehensive, sustainable intersectoral policies[61].

Notifications among Indigenous people were excluded from the correspondence analysis due to low case numbers despite ethnic relevance in Mato Grosso and different self-inflicted injury characteristics than brown, black, asian and white people[62]. A systematic review study on suicide among Indigenous peoples[63] found that, given the specificities of this population and the complex historical and social context that fosters self-harm, there is a higher prevalence of more lethal methods of self-inflicted injuries, such as hanging. Considering the particular characteristics of the Indigenous population, the large number of ethnic groups throughout the national territory[63], with singularities in their cultures, and the differences between the means used when compared to other population groups[52], evidenced in this study, there is an imperative need for studies that investigate the occurrence of self-inflicted injuries in this population in greater depth.

Difficulty finding national studies on adolescents engaging in intentional self-inflicted injuries was a limitation, requiring comparison with generalized populations or international studies that, while relevant, differ socioculturally.

Underreporting of self-inflicted injuries in VIVA-SINAN is another limitation, although growth has occurred since mandatory notification from 2016. However, its quality, with regard to proper completion and inconsistency, is still a weak point of the system[26,64]. Notably, identifying whether or not there was suicidal intent in self-harm is fundamental for investigations into this event, which is increasingly found in Brazilian society. However, due to this variable's poor recording quality in the database used in this research, we could not distinguish attempted suicide case from non-suicidal self-harm cases.

From another perspective, we underscore the health sector's fundamental leadership role in intersectoral coordination for comprehensive care interventions and health promotion actions aimed at collective strategies to confront violence[65].

Conclusions

The application of multiple correspondence analysis identified variables forming distinct clustering patterns, allowing specific preventive interventions of these conditions in adolescents. The study also highlighted need for further investigation regarding profiles of adolescents engaging in self-inflicted injuries, since early identification of distress is fundamental for reducing self-inflicted injury cases and preventing suicide in this population.

Inclusion in the interpersonal/self-inflicted violence notification form of a specific field identifying suicidal intent in cases recorded as self-inflicted injury could improve future epidemiological analyses and contribute to more assertive actions before this complex subject.

Effective structuring of a Psychosocial Care Network (RAPS) focused on specialized and qualified listening from the perspective of care and protection for adolescents, the improvement of case reporting, the qualification of professionals for care, the reduction of access to means used in self-harm, and the encouragement of research on the subject are essential for the prevention of intentionally self-inflicted injuries. It is also important to reinforce the need to expand intersectoral training processes for collective action more consistent with the provisions of current legislation for the protection of children and adolescents.

Furthermore, promoting debate with adolescents as protagonists is indispensable

for effective prevention and care. This issue must be included in agendas of health, social assistance, security, justice, and education institutions to ensure protective interventions and avoid revictimization. We should also underscore the need to strengthen and make the implementation of existing laws and regulations more effective through public policies that provide responses to address self-inflicted violence among adolescents.

Authorship contributions

Oliveira LR (0000-0002-7325-1391)* and Conciani ME (0000-0002-0675-6314)* contributed to the work's conception and design, data collection, analysis and interpretation, drafting and critical review, and approval of the manuscript's final version. Campos LJA (0000-0003-2739-2764)* contributed to the work's conception, data collection, analysis and interpretation, drafting, and approval of the manuscript's final version. Andrade ACS (0000-0002-3366-4423)* contributed to the work's conception and design, analysis and interpretation, drafting and critical review, and approval of the manuscript's final version. Melanda FN (0000-0002-5692-0215)* contributed to the work's conception and design, drafting and critical review, and approval of the manuscript's final version. ■

References

1. Ministério da Saúde (BR), Secretaria de Vigilância em Saúde e Ambiente. Panorama dos suicídios e lesões autoprovocadas no Brasil de 2010 a 2021 [Internet]. Brasília, DF: Ministério da Saúde; 2024 [acesso em 2024 fevereiro 27]. 18 p. Disponível em: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2024/boletim-epidemiologico-volume-55-no-04.pdf

2. Jaen-Varas D, Mari JJ, Asevedo E, et al. The association between adolescent suicide rates and socioeconomic indicators in Brazil: a 10-year retrospective ecological study. Braz J Psychiatry. 2019;41(5):389-95. DOI: https://doi.org/10.1590/1516-4446-2018-0223.

3. World Health Organization. Preventing suicide: A global imperative. Geneva: WHO; 2014.

4. Steinberg L, Morris AS. Adolescent Development. Ann Rev Psychol. 2001;52(1):83-110. DOI: https://doi.org/10.1146/annurev.psych.52.1.83

5. Eisenstein E. Adolescência: definições, conceitos e critérios. Adolesc Saúde [Internet]. 2005 [acesso em 2024 fev 17];2(2):6-7. Disponível em https://adolescenciaesaude.com/2005/vol-2-2/adolescence-definitions-concepts-and-criteria/

6. Organização Mundial da Saúde. Ação Global Acelerada para a Saúde de Adolescentes (AA-HA!): guia de orientação para apoiar a Implementação pelos países. Washington, D.C.: Organização Pan-Americana da Saúde; 2018. DOI: https://doi.org/10.37774/9789275719985

7. Santoro Junior M. Saúde e violência na infância e na adolescência. J Pediatr. 1994;70(5):263-266. DOI: https://doi.org/10.2223/JPED.683

8. Takeiti BA, Gonçalves MV, Oliveira SPASD, et al. O estado da arte sobre as juventudes, as vulnerabilidades e as violências: o que as pesquisas informam? Saúde Soc. 2020;29(3):e181118. DOI: https://doi.org/10.1590/S0104-12902020181118

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9. Presidência da República (BR). Lei nº 8.069, de 13 de julho de 1990. Dispõe sobre o Estatuto da Criança e do Adolescente e dá outras providências [Internet]. Diário Oficial da União, Brasília, DF. 1990 jul 16 [acesso em 2024 fev 17]; Seção I:13563. Disponível em: https://www2.camara.leg.br/legin/fed/lei/1990/lei-8069-13-julho-1990-372211-publicacaooriginal-1--pl.html

10. Presidência da República (BR), Secretaria de Direitos Humanos, Secretaria Nacional de Promoção dos Direitos da Criança e do Adolescente, Conselho Nacional dos Direitos da Criança e do Adolescente. Plano Decenal dos Direitos Humanos de Crianças e Adolescentes 2011-2021. Brasília, DF; 2010.

11. Presidência da República (BR). Decreto nº 11.074, de 18 de maio de 2022. Altera o Decreto nº 9.579, de 22 de novembro de 2018, para instituir o Programa de Proteção Integral da Criança e do Adolescente – Protege Brasil e o seu Comitê Gestor [Internet]. Diário Oficial da União, Brasília, DF. 2022 maio 19 [acesso em 2024 fev 17]. Seção I:2. Disponível em: https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2022/decreto/D11074.htm

12. Presidência da República (BR), Secretaria Geral Subchefia para Assuntos Jurídicos. Lei nº 13.431, de 4 de abril de 2017. Estabelece o sistema de garantia de direitos da criança e do adolescente vítima ou testemunha de violência e altera a Lei º 8.069, de 13 de julho de 1990 (Estatuto da Criança e do Adolescente). Diário Oficial da União [Internet], Brasília, DF. 2017 abr 5 [acesso em 2024 fev 17]; Seção I:1. Disponível em: https://pesquisa.in.gov.br/imprensa/jsp/visualiza/index.jsp?jornal=1&pagina=1&data=05/04/2017

13. Ministério da Saúde (BR), Secretaria de Atenção em Saúde, Departamento de Ações Programáticas Estratégicas. Diretrizes nacionais para a atenção integral à saúde de adolescentes e jovens na promoção, proteção e recuperação da saúde Brasília, DF: Ministério da Saúde; 2010. 132 p. (Série A. Normas e Manuais Técnicos).

14. Ministério da Saúde (BR); Conselho Municipal de Saúde. Resolução nº 756, de 15 de agosto de 2024. Dispõe sobre a aprovação da Política Nacional de Atenção Integral à Saúde de Adolescentes e Jovens (PNAISAJ), a ser publicada em portaria específica do Ministério da Saúde. Diário Oficial da União [Internet], Brasília, DF. 2024 out 24 [acesso em 2024 fev 17]; Seção I:83. Disponível em: https://www.gov.br/conselho-nacional-de-saude/pt-br/atos-normativos/resolucoes/2024/reso756-dispoe-sobre-a-aprovacao-da-pnaisaj.pdf

15. Ministério da Saúde (BR). Portaria nº 1.876, de 14 de agosto de 2006. Institui as Diretrizes Nacionais para Prevenção do Suicídio [Internet]. Diário Oficial da União, Brasília, DF. 2006 ago 15 [acesso em 2020 novembro 10]; Seção I:65. 18 p. Disponível em: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2006/prt1876_14_08_2006.html

16. Ministério da Saúde (BR), Secretaria de Atenção à Saúde, Departamento de Ações Programáticas Estratégicas. Agenda de Ações Estratégicas para a Vigilância e Prevenção do Suicídio e Promoção de Saúde [Internet]. Brasília, DF: Ministério da Saúde; 2017 [acesso em 2021 março 10]. 36 p. Disponível em: https://portalarquivos2.saude.gov.br/images/pdf/2017/setembro/21/17-0522-cartilha-- Agenda-Estrategica--publicada.pdf

17. Presidência da República (BR). Lei nº 15.231, de 6 de outubro de 2025. Altera as Leis nºs 13.819, de 26 de abril de 2019, e 9.394, de 20 de dezembro de 1996 (Lei de Diretrizes e Bases da Educação Nacional), para dispor sobre a notificação ao Conselho Tutelar, pelos estabelecimentos de ensino, dos casos de violência neles ocorridos, especialmente automutilação e suicídio. Diário Oficial da União [Internet], Brasília, DF. 2025 out 7 [acesso em 2024 fev 17]. Seção I:1. Disponível em: https://www.in.gov.br/en/web/dou/-/lei-n-15.231-de-6-de-outubro-de-2025-660714219.

18. Fonseca PHN, Silva AC, Araújo LMC, et al. Autolesão sem intenção suicida entre adolescentes. Arq Bras de Psicol [Internet]. 2018 [acesso em 2024 fev 17];70(3):246-58. Disponível em: http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1809--52672018000300017&lng=pt

19. Brito FAMD, Moroskoski M, Shibukawa BMC, et al. Violência autoprovocada em adolescentes no Brasil, segundo os meios utilizados. Cogit Enferm. 2021;26(1):e76261. DOI: https://doi.org/10.5380/ce.v26i0.76261

20. Bahia CA, Avanci JQ, Pinto LW, et al. Lesão autoprovocada em todos os ciclos da vida: perfil das vítimas em serviços de urgência e emergência de capitais do Brasil. Ciênc saúde coletiva. 2017;22(1):2841-50. DOI: https://doi.org/10.1590/1413-81232017229.12242017

21. Ministério da Saúde (BR). Suicídio: saber, agir e prevenir. Boletim Epidemiológico. Brasília, DF: Ministério da Saúde; 2017.

22. Silva TMM, Schoen TH. Autolesão não suicida na adolescência. In: Costa FC, Sampaio EC, organizadores. Desenvolvimento da criança e do adolescente: Evidências científicas e considerações teóricas-práticas. São Paulo: Editora Científica; 2020. p. 310-24.

23. Nascimento FCS, Marcon SR, Freitas BHBM, et al. Suicídio por autointoxicação entre adolescentes e adultos jovens brasileiros: estudo de séries temporais. Ciênc Cuid Saúde. 2021;20(1):57899. DOI: http://dx.doi.org/10.4025/cienccuidsaude.v20i0.57899

24. Bahia CA, Avanci JQ, Pinto LW, et al. Notificações e internações por lesão autoprovocada em adolescentes no Brasil, 2007-2016. Epidemiol Serv Saúde. 2020;29(2):1-12. DOI: https://doi.org/10.5123/S1679-49742020000200006

25. Luis MA, Monroy NAJ, Godoi LG, et al. Lesão autoprovocada entre adolescentes: prevalência e fatores associados, Espírito Santo, Brasil. Aquichan. 2021;21(3):e2133. DOI: https://doi.org/10.5294/aqui.2021.21.3.3

26. Aragão CMC, Mascarenhas MDM. Temporal trend of self-inflicted injury notifications in adolescents in the school environment, Brazil, 2011-2018. Epidemiol Serv Saúde. 2022;31(1):e20220028. DOI: https://doi.org/10.1590/S1679-49742022000100028

27. Vieira LP, Santana VTP, Suchara EA. Characterization of suicide attempts by exogenous substances. Cad Saúde Colet. 2015;23(2):118-123. DOI: https://doi.org/10.1590/1414-462X201500010074

28. Machado DB, Santos DN. Suicídio no Brasil, de 2000 a 2012. J Bras Psiquiatr. 2015;64(1):45-54. DOI: https://doi.org/10.1590/0047-2085000000056

29. Calixto Filho M, Zerbini T. Epidemiologia do suicídio no Brasil entre os anos de 2000 e 2010. Saúde, Ética Justiça. 2016;21(2):45-51. DOI: https://doi.org/10.1590/0047-2085000000056

30. Oliveira LR, Benedetti AOC. Suicídio em Mato Grosso – Brasil: 1996 a 2015. J Health Biol Sci. 2018;6(4):391-398. DOI: https://doi.org/10.12662/2317-3076

31. TabNet [Internet]. Brasília, DF: DataSUS; [data desconhecida] [acesso em 2020 fev 25]. Disponível em: http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sinannet/cnv/violemt.def

32. Plener PL, Schumacher TS, Munz LM, et al. The longitudinal course of non-suicidal self-injury and deliberate self-harm: a systematic review of the literature. Borderline Personal Disord Emot Dysregul. 2015;2:2. DOI: https://doi.org/10.1186/s40479-014-0024-3

33. Lewinsohn PM, Rohde P, Seeley JR. Psychosocial risk factors for future adolescent suicide attempts. J Consult Clin Psychol. 1994;62(2):297-305. DOI: https://doi.org/10.1037//0022-006x.62.2.297

34. Bridge JA, Goldstein TR, Brent DA. Adolescent suicide and suicidal behavior. J Child Psychol Psychiatry. 2006;47(3-4):372-94. DOI: https://doi.org/10.1111/j.1469-7610.2006.01615.x

35. Ministério da Saúde (BR). Portaria de Consolidação nº 4, de 28 de setembro de 2017. Consolidação das normas sobre os sistemas e os subsistemas do Sistema Único de Saúde. Diário Oficial da União, Brasília, DF. 2017 out 3; Suplemento:288.

36. Ministério da Saúde (BR), Secretaria de Vigilância em Saúde, Departamento de Vigilância de Doen-

ças e Agravos Não Transmissíveis e Promoção de Saúde. Viva: Instrutivo notificação de violência interpessoal e autoprovocada [Internet]. Brasília, DF: Ministério da Saúde; 2016 [acesso em 2020 fev 25]. Disponível em: https://bvsms.saude.gov.br/bvs/publicacoes/viva_instrutivo_violencia_interpessoal_autoprovocada_2ed.pdf

37. Infantosi AFC, Costa JCDGD, Almeida RMVRD. Análise de Correspondência: bases teóricas na interpretação de dados categóricos em Ciências da Saúde. Cad Saúde Pública. 2014;30(1):473-86. DOI: https://doi.org/10.1590/0102-311X00128513

38. Mingoti SA. Análise de dados através de métodos estatística multivariada: uma abordagem aplicada. Belo Horizonte: Editora UFMG; 2007. 295 p.

39. Bertoncelo E. Construindo espaços relacionais com a análise de correspondências múltiplas: aplicações nas ciências sociais. Brasília, DF: Enap; 2022. 143 p.

40. Conselho Nacional de Saúde (BR). Resolução nº 510, de 7 de abril de 2016. Dispõe sobre as normas aplicáveis a pesquisas em Ciências Humanas e Sociais cujos procedimentos metodológicos envolvam a utilização de dados diretamente obtidos com os participantes ou de informações identificáveis ou que possam acarretar riscos maiores do que os existentes na vida cotidiana [Internet]. Diário Oficial da União, Brasília, DF. 2016 maio 24 [acesso em 2026 fev 20]; Seção I:44. Disponível em: https://www.gov.br/conselho-nacional-de-saude/pt-br/atos-normativos/resolucoes/2016/resolucao-no-510.pdf/view

41. Borges VR, Werlang BSG. Estudo de ideação suicida em adolescentes de 15 a 19 anos. Estud Psicol 2006;11(1):345-351. DOI: https://doi.org/10.1590/S1413-294X2006000300012

42. Rodrigues FM, Oliveira PPD, Silva HCD, et al. Comportamento suicida: o perfil epidemiológico das lesões autoprovocadas no Estado de Goiás. Rev Cient Esc Estadual Saúde Pública Goiás "Cândido Santiago". 2020;6(2):1-15. DOI: https://doi.org/10.22491/2447-3405.2020.V6N2.600003

43. Lovisi GM, Santos AS, Legay L, et al. Análise epidemiológica do suicídio no Brasil entre 1980 e 2006. Braz J Psychiatry. 2009;31(2):S86-S93. DOI: https://doi.org/10.1590/S1516-44462009000600007

44. Nock MK. Why do people hurt themselves? New insights into the nature and functions of self-injury. Curr Dir Psychol Sci. 2009:18(2):78-83. DOI: https://doi.org/10.1111/j.1467-8721.2009.01613.x

45. Otto SC, Dos Santos KA. O Tumblr e sua relação com práticas autodestrutivas: o caráter epidemico da autolesão. Psic Rev. 2016;25(2):265-88.

46. Favazza AR. Nonsuicidal self-injury: How categorization guides treatment. Curr Psychiatry. 2012;11(3):21-5.

47. Ministério da Saúde (BR), Secretaria de Gestão Estratégica e Participativa, Departamento de Apoio à Gestão Participativa e ao Controle Social. Óbitos por suicídio entre adolescentes e jovens negros 2012 a 2016. Brasília, DF: Ministério da Saúde; 2018.

48. Instituto Brasileiro de Geografia e Estatística. Coordenação de População e Indicadores Sociais. Desigualdades Sociais por Cor ou Raça no Brasil. Rio de Janeiro: IBGE; 2019.

49. Oliveira EM, França SS, Silva EM, et al. Discriminação racial de jovens negros no Brasil: revisão integrativa. Res Soc Dev. 2021;10(14):1-12. DOI: http://dx.doi.org/10.33448/rsd-v10i14.22013

50. Tavares JSC. Suicídio na população negra brasileira: nota sobre mortes invisibilizadas. Rev Bras Psic. 2017;04(01):73-5.

51. Lindsey MA, Sheftall AH, Xiao Y, et al. Trends of suicidal behaviors among high school students in the United States: 1991–2017. Pediatrics. 2019 Nov;144(5):e20191187. DOI: https://doi.org/10.1542/peds.2019-1187

52. Souza RSBD, Oliveira JCD, Alvares-Teodoro J, et al. Suicídio e povos indígenas brasileiros: revisão sistemática. Rev Panam Salud Pública. 2020;44(1):e58. DOI: https://doi.org/10.26633/RPSP.2020.58

53. Santos IN, Black TCL, Silva KV, et al. O racismo estrutural e seu impacto na saúde do adolescente afrodescendente brasileiro. Physis. 2024;34:e34025. DOI: https://doi.org/10.1590/S0103-7331202434025pt

54. Presidência da República (BR). Plano Nacional de Enfrentamento da Violência contra Crianças e Adolescentes. Brasília, DF: MDHC; 2021.

55. Ministério da Saúde (BR), Gabinete do Ministro. Portaria nº 1.271, de 6 de junho de 2014. Define a Lista Nacional de Notificação Compulsória de doenças, agravos e eventos de saúde pública nos serviços de saúde públicos e privados em todo o território nacional, nos termos do anexo, e dá outras providências [Internet]. Diário Oficial da União, Brasília, DF. 2014 jun 9 [acesso em 2024 fev 17]; Seção I:67. Disponível em: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2014/prt1271_06_06_2014.html

56. Nock MK. Self-injury. Annu Rev Clin Psychol. 2010;6:339-63. DOI: https://doi.org/10.1146/annurev.clinpsy.121208.131258

57. Linehan MM. One population or two? In: Annals of the New York Academy of Sciences. New York: John Wiley & Sons; 1986. p. 16-33. DOI: https://doi.org/10.1111/j.1749-6632.1986.tb27882.x

58. Muehlenkamp JJ. Self-injurious behavior as a separate clinical syndrome. Am J Orthopsychiatry.2005;75(2):324-33. DOI: https://doi.org/10.1037/0002-9432.75.2.324

59. Skegg K. Self-harm. The Lancet. 2005;366(9495):1471-83. DOI: https://doi.org/10.1016/S0140-6736(05)67600-3

60. Na PJ, Shin J, Kwak HR, et al. Social Determinants of Health and Suicide-Related Outcomes: A Review of Meta-Analyses. JAMA Psychiatry. 2025;82(4):337-46. DOI: https://doi.org/10.1001/jamapsychiatry.2024.4241

61. Dantas ESO, Amorim, KPC. Prevenção do suicídio no Brasil: análise contemporânea para avanços necessários. Ciênc saúde coletiva [Internet]. 2025 [acesso em 2025 nov 20]. Disponível em: http://cienciaesaudecoletiva.com.br/artigos/prevencao-do-suicidio-no-brasil-analise-contemporanea-para-avancos-necessarios/19866

62. Alves FJO, Fialho E, Paiva de Araújo JÁ, et al. The rising trends of self-harm in Brazil: an ecological analysis of notifications, hospitalisations, and mortality between 2011 and 2022. Lancet Reg Health Am. 2024;31:100691. DOI: https://doi.org/10.1016/j.lana.2024.100691

63. Araujo JAP, Fialho E, Alves FJO, et al. Suicide among Indigenous peoples in Brazil from 2000 to 2020: a descriptive study. Lancet Reg Health Am. 2023;26:100591. DOI: https://doi.org/10.1016/j.lana.2023.100591

64. Girianelli VR, Cordeiro GTL. Inconsistências nas notificações de violência no estado do Rio de Janeiro de 2015 a 2021. Saúde Debate. 2023;47(1):e8948. DOI: https://doi.org/10.1590/2358-28982023E18948P.

65. Ribeiro MMR, Tavares R, Melo EM, et al. Promoção de saúde, participação em ações coletivas e situação de violência entre usuários da Atenção Primária à Saúde. Saúde Debate. 2018;42(4):43-54. DOI: https://doi.org/10.1590/0103-11042018S403

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