

# Self-inflicted violence among adolescents in Brazil: An analysis of the notifications made during the 2012-2022 period

*Violência autoprovocada e adolescência no Brasil: análise das notificações do período de 2012 a 2022*

*Violencia autoinfligida y adolescencia en Brasil: análisis de casos notificados entre 2012 y 2022*

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## ABSTRACT

**Objective:** to describe the profile of self-inflicted violence reports among adolescents in the Notifiable Diseases Information System (*Sistema de Informação de Agravos de Notificação*, SINAN) from 2012 to 2022. **Method:** a descriptive epidemiological study based on secondary data from the SINAN, covering adolescents aged 10-19 years old. Data on gender, age group, region where the events took place, schooling level and race were analyzed. **Results:** a total of 824,430 self-inflicted violence cases were reported between 2012 and 2022, with prevalence among female adolescents (69%). The Southeast region concentrated most of the reports (44%) and the Northeast region had the highest Proportional Percentage Variation (216.66%). **Conclusion:** self-inflicted violence among adolescents in Brazil is a serious Public Health problem, with prevalence among girls. It is essential to implement public policies that promote mental health and prevent self-harm behaviors. The measures implemented by the Health at School Program and other intersectoral actions are relevant to supporting at-risk adolescents.

**Descriptors:** Adolescent; Violence; Self-Injurious Behavior; Epidemiology.

## RESUMO

**Objetivo:** descrever o perfil das notificações de violência autoprovocada entre adolescentes no Sistema de Informação de Agravos de Notificação (SINAN) de 2012 a 2022. **Método:** estudo descritivo epidemiológico baseado em dados secundários do SINAN, abrangendo adolescentes de 10 a 19 anos. Foram analisados dados sobre sexo, faixa etária, região de ocorrência, escolaridade e raça. **Resultados:** entre 2012 e 2022, foram notificados 824.430 casos de violência autoprovocada, com prevalência entre adolescentes do sexo feminino (69%). A região sudeste concentrou a maior parte das notificações (44%), a região nordeste apresentou a maior variação percentual proporcional (216,66%). **Conclusão:** a violência autoprovocada entre adolescentes no Brasil é um grave problema de saúde pública, com prevalência entre meninas. É fundamental implementar políticas públicas que promovam a saúde mental e previnam comportamentos autolesivos. As ações do Programa Saúde na Escola e outras ações intersetoriais são relevantes para o apoio dos adolescentes em risco.

**Descritores:** Adolescência; Violência; Comportamento Autodestrutivo; Epidemiologia.

## RESUMEN

**Objetivo:** describir el perfil de las denuncias de violencia autoinfligida en adolescentes en el Sistema de Información de Eventos de Notificación Obligatoria (*Sistema de Informação de Agravos de Notificação*, SINAN) durante el periodo de 2012 a 2022. **Método:** estudio epidemiológico y descriptivo basado en datos secundarios del SINAN y realizado con adolescentes de 10 a 19 años. Se analizaron datos sobre sexo, grupo etario, región de ocurrencia, educación y raza. **Resultados:** se reportaron 824.430 casos de violencia autoinfligida entre 2012 y 2022, con prevalencia en adolescentes del sexo femenino (69%). La región sudeste concentró la mayor parte de las notificaciones (44%) y la región nordeste presentó la mayor Variación Porcentual Proporcional (216,66%). **Conclusión:** la violencia autoinfligida entre adolescentes en Brasil es un grave problema salud pública, con prevalencia entre las niñas. Es fundamental implementar políticas públicas que promuevan la salud mental y prevengan conductas autolesivas. Las acciones del Programa Salud en la Escuela y otras acciones intersectoriales son relevantes para apoyar a los adolescentes en riesgo.

**Descritores:** Adolescente; Violencia; Conducta Autodestructiva; Epidemiología.

## INTRODUCTION

Self-inflicted violence in adolescence is a public health problem that exerts a significant impact on society, requiring timely prevention actions during this life phase. Compulsory notification of these events is essential to support health surveillance, guiding prevention and control interventions. The Information System for Notifiable Diseases (SINAN) classifies self-inflicted violence into suicide attempts and self-harm, according to each notification form. Analyzing SINAN data can help understand the magnitude of the phenomenon and its social and health implications<sup>1</sup>.

Adolescents are more vulnerable to self-inflicted violence due to the developmental stage they experience, which involves the transition from childhood to adulthood, the bodily transformations and emotional complexities they go through, issues related to sexuality/gender and lack of social support<sup>2,3</sup>. Some studies indicate that factors such as family structure, social issues and presence of mental health problems are important determinants of self-harm behaviors<sup>4</sup>. These adolescents are at an increased risk of serious consequences for their mental and physical health, such as anxiety disorders, depression and suicide risk<sup>5</sup>.

In the international context, self-inflicted violence among adolescents is also a growing concern. In the United States, the Centers for Disease Control and Prevention (CDC) reported a 57.4% increase in suicide rates between 2007 and 2018 among young people aged 10 to 24<sup>6</sup>. This fact highlights the need for a comprehensive approach to preventing self-inflicted violence, incorporating evidence-based strategies to reduce these behaviors<sup>7</sup>.

Self-inflicted violence is addressed in Law No. 13,819 of April 26<sup>th</sup>, 2019, which establishes the National Policy for the Prevention of Self-harm and Suicide<sup>8</sup>. This law highlights the importance of integrated and multisectoral strategies for preventing, identifying and monitoring self-inflicted violence, recognizing the need for adequate psychological and social support for adolescents in risk situations<sup>9</sup>. Data from the Ministry of Health reveal that 32,733 self-inflicted violence cases among adolescents were reported in Brazil during 2021, evidencing the urgency of effective intervention measures<sup>10</sup>.

The Violence and Accident Surveillance (*Vigilância de Violências e Acidentes*, ViVA) system began reporting self-inflicted violence cases in 2006, which were incorporated into sentinel events in 2009 and into the Compulsory Notification List in 2011<sup>11</sup>. Ordinance No. 2,920 of November 10<sup>th</sup>, 2020, reinforces the need for immediate notification to health surveillance for appropriate intervention actions<sup>12</sup>. Knowing these data is relevant to develop public policies focused on promoting safe and welcoming environments for adolescents<sup>13</sup>.

In addition to the Brazilian data, the World Health Organization (WHO) points out that suicide is the fourth leading cause of death among adolescents aged 15 to 19 worldwide, indicating that the problem transcends borders and requires coordinated efforts at the international level<sup>14</sup>. The approach to preventing self-inflicted violence should include promoting mental health, early identifying risk signs and easing access to appropriate support and treatment services<sup>15</sup>.

By providing a detailed overview of these events, the intention is to contribute to improving Public Health practices, supporting professionals in the area and encouraging scientific knowledge growth in this field, which is essential to devise effective prevention and intervention strategies.

The objective of this study was to describe the profile corresponding to notifications of self-inflicted violence among adolescents in the SINAN, from 2012 to 2022.

## METHOD

This is a descriptive, epidemiological and historical series study conducted with secondary data obtained from notifications of self-inflicted violence cases in Brazil.

The cases included corresponded to self-inflicted violence among adolescents of both genders aged 10 to 19, reported in all Brazilian regions between 2012 and 2022. The years 2023 and 2024 were not included due to lack of information in the database.

The SINAN is fed by notification/investigation forms, which are divided into blocks with fields to be filled in referring to the characteristics of the notification *locus*, the victims and the self-inflicted violence cases. The SINAN data were obtained in June 2024, encompassing the “health region”, “year of the events”, “age”, “gender”, “race/skin color” and “schooling level” fields/variables.

Microsoft Office Excel 2013 was used to process the collected data. Descriptive statistics was employed, calculating the absolute and relative frequencies of the study variables. To verify the variation in notifications during the study period, the Proportional Percentage Variation (PPV) was calculated by region where the events took place, considering the 2012-2022 period. The formula used to calculate the PPV was  $\{[(\text{Final year}-\text{Initial year})/\text{Initial year}]*100\}$ .

All the information used is in the public domain and no data may cause harm/risk or individual and/or collective exposure. Therefore, submission to any Research Ethics Committee (*Comitê de Ética em Pesquisa*, CEP) was waived.

## RESULTS

During the study period (2012-2022), 824,430 self-inflicted violence cases among adolescents were reported, with their distribution shown in Table 1 according to region where the events took place.

**Table 1:** Distribution of self-inflicted violence cases among adolescents, according to region where the events took place and year of the events (n=824,460). Brazil, 2022.

Region where the events took place												Region	PPV
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	(Total)	2012-2022
North	3,551	4,752	5,127	5,425	6,032	6,968	7,339	8,735	6,621	7,642	10,485	72,677	195.29
Northeast	7,429	10,200	10,509	10,521	10,911	13,908	15,664	17,854	13,750	17,319	23,524	151,589	216.66
Southeast	18,336	20,648	22,506	24,703	28,312	36,513	40,198	45,054	32,496	38,625	55,193	362,584	200.96
South	9,020	10,487	11,290	11,716	12,567	16,787	19,452	23,433	15,150	16,892	22,269	169,063	146.77
Midwest	3,841	4,547	4,389	4,515	4,621	5,728	6,602	8,635	6,812	7,684	11,143	68,517	190.02
<b>Brazil (Total)</b>	<b>42,177</b>	<b>50,634</b>	<b>53,821</b>	<b>56,880</b>	<b>62,443</b>	<b>79,904</b>	<b>89,255</b>	<b>103,711</b>	<b>74,829</b>	<b>88,162</b>	<b>122,614</b>	<b>824,430</b>	<b>191.33</b>

Notes: PPV - Proportional Percentage Variation. Source: SINAN, 2024.

The Brazilian regions most affected by these cases were Southeast (n=362,584; 44%), South (n=169,063; 20%) and Northeast (n=151,589; 18%). Within this estimate, the fewest events were recorded in the Midwest region (n=68,517; 8%). During this period, there was a significant increase in the frequency of case records in all regions of the country, in ascending order: Northeast (PPV=216.66%), Southeast (PPV=200.96%), North (PPV=195.29%), Midwest (PPV=190.02%) and South (PPV=146.77%).

The distribution of self-inflicted violence cases among adolescents according to gender and age group is presented in Table 2.

**Table 2:** Distribution of self-inflicted violence cases among adolescents according to gender and age group. Brazil, 2022.

	Region where the events took place					
	North	Northeast	Southeast	South	Midwest	Total
<b>Gender</b>						
Male	12,363	54,838	107,405	51,484	20,418	249,508
Female	57,314	96,751	255,179	117,579	48,099	574,922
<b>Total</b>	<b>72,677</b>	<b>151,589</b>	<b>362,584</b>	<b>169,063</b>	<b>68,517</b>	<b>824,430</b>
<b>Age group</b>						
10-14 years old	37,692	55,677	133,434	74,612	27,892	329,307
15-19 years old	34,985	95,912	229,150	94,451	40,625	495,123
<b>Total</b>	<b>72,677</b>	<b>151,589</b>	<b>632,584</b>	<b>169,063</b>	<b>68,517</b>	<b>824,430</b>

Source: SINAN, 2024.

Self-inflicted violence is more prevalent among females (n=574,922; 69%) in all Brazilian regions. The Southeast concentrates the highest proportion of self-inflicted violence both by gender (n=362,584; 44%) and by age group, with 133,434 (41%) reports among adolescents aged 10 to 14 and 229,150 (46%) in those aged 15 to 19. The South is the second region with the highest number of reports among young people aged 10 to 14 (n=74,612; 23%), as is the Northeast among those aged 15 to 19 (n=95,912; 19%).

Table 3 presents the findings related to the cases according to schooling and race/skin color.

**Table 3:** Distribution of self-inflicted violence cases among adolescents according to schooling and race/skin color. Brazil, 2022.

Variables	n	f (%)
<b>Schooling</b>		
Unknown/Blank	271,197	32.89
Illiterate	2,779	0.34
1 <sup>st</sup> to 4 <sup>th</sup> incomplete ES year	36,468	4.42
4 <sup>th</sup> complete ES year	25,590	3.10
5 <sup>th</sup> to 8 <sup>th</sup> incomplete ES year	230,064	27.91
Complete Elementary School	54,864	6.66
Incomplete High School	139,875	16.97
Complete High School	52,642	6.39
Incomplete Higher Education	8,447	1.01
Complete Higher Education	1,219	0.15
Not applicable	1,285	0.16
<b>Race/Skin color</b>		
Unknown/Blank	90,904	11.04
White	303,964	36.89
Black	64,225	7.80
Asian	6,482	0.79
Brown	350,206	42.43
Indigenous	8,649	1.05

Source: SINAN, 2024.

As for schooling in the self-inflicted violence cases notified, most of the information is either marked as unknown or blank (n=271,197; 33%). However, the analysis of the information that did present the respective data reveals higher prevalence of self-inflicted violence cases in adolescents with incomplete 5<sup>th</sup> to 8<sup>th</sup> Elementary School year (n=230,064; 28%) and Incomplete High School (n=139,875; 17%) (Table 3).

In terms of race/skin color, there was predominance of brown skin (n=350,206; 42%), followed by white (n=303,964; 36.2%). Black race/skin color appears as the 3<sup>rd</sup> most prevalent (n=64,225; 8%). If the brown and black races/skin colors are added up, the result is a total of 414,431 (50%) of the reported cases. It is worth noting that 90,904 (12%) of the notifications had this data marked as unknown or blank.

## DISCUSSION

Self-inflicted violence among adolescents is a complex phenomenon that has drawn increasing attention worldwide due to its serious implications for young people's mental and physical health. In Brazil, the data from the Information System for Notifiable Diseases (SINAN) between 2012 and 2022 indicate a significant increase in cases, with 824,430 notifications recorded during that period. The analysis of these data reveals important patterns that need to be understood in order to devise effective public policies.

The prevalence of self-inflicted violence is higher among female adolescents, accounting for 69% of the cases notified. This nationwide pattern is consistent with international studies showing that girls are more prone to engaging in self-harm behaviors than boys<sup>16,17</sup>. In Brazil, these issues may be exacerbated by specific cultural and socioeconomic factors, and girls' propensity to engage in self-harm may be explained by the fact that women and men deal differently with experiences as they grow up. Girls are traditionally more prone to identifying, recognizing and being aware of emotional experiences. Thus, they are more likely to seek ways to regulate their emotions, with the possibility for self-harm behaviors to emerge as an alternative<sup>18</sup>.

The regional distribution of self-inflicted violence cases also has implications for discussion. For example, the Southeast region concentrates the highest proportion of notifications, both by gender and by age group. Specifically, 44% of the reports were made in this region, with high incidence among adolescents aged 15 to 19. This concentration can be attributed to factors such as urbanization, academic stress and access to self-harm means. Adolescents suffer family, school and social pressure, in addition to pressure to normalize and discipline their behaviors and bodies, and these conditions trigger different forms of coping<sup>19</sup>.

In turn, the Northeast region presented the highest Proportional Percentage Change (PPV), with 216.66%, indicating exponential growth in self-inflicted violence cases. This region faces socioeconomic challenges that may

increase adolescents' vulnerability. The literature suggests that poverty, limited access to mental health services and domestic violence are significant risk factors for self-harm behaviors<sup>20</sup>.

The schooling level of adolescents that engage in self-inflicted violence is another important factor to be considered. Most of the cases notified involve adolescents with Incomplete Elementary School, suggesting a correlation between low instructional level and more vulnerability to self-harm behaviors. International studies indicate that lack of educational support and limited prospects can contribute to feelings of hopelessness and self-injurious behaviors<sup>21</sup>.

The race/skin color analysis reveals that brown- and white-skinned adolescents are the most affected, representing 42% and 36% of the cases, respectively, whereas black-skinned adolescents represent 8%. The fact that 50% of those affected are brown- and black-skinned deserves special attention, considering racial disparities and the specific challenges they face. A number of studies show that black-skinned adolescents may face additional discrimination and stigma, which can contribute to self-harm behaviors<sup>22,23</sup>. Consequently, inclusive approaches that recognize and address these disparities are essential.

In addition to regional and educational disparities, the COVID-19 pandemic exerted a significant impact on adolescents' mental health worldwide, exacerbating mental health problems, including an increase in self-harm behaviors<sup>24</sup>. In Brazil, the pandemic impact may have amplified the challenges faced by adolescents, especially those already vulnerable due to socioeconomic conditions or pre-existing mental health issues.

The results show that many notifications in the SINAN present incomplete or unknown information, which limits full understanding of the problem. Therefore, improving the quality of the data collected, such as standardizing the notification procedures and training of health professionals, can be a possible way to contribute to accuracy in the analyses and effectiveness of the interventions.

In terms of public policies, Brazil can benefit from implementing evidence-based prevention programs that have already proved to be effective in other countries. School-based intervention programs that address mental health, such as those implemented in Australia and United Kingdom, have been shown to be effective in reducing self-harm behaviors among adolescents<sup>25</sup>.

Furthermore, community engagement and mental health awareness-raising campaigns can assist in reducing the stigma associated with self-harm behaviors and encourage adolescents to seek help. In Japan, national awareness-raising campaigns and community support programs have shown promising results in reducing the number of suicides among adolescents<sup>26</sup>. Implementing similar strategies in Brazil might contribute to reducing self-inflicted violence cases.

Another recommended approach is to integrate mental health services into Primary Care, given its potential to improve access to health promotion actions and monitor more vulnerable adolescents<sup>27</sup>. It is also worth reflecting on the need to advance in expanding access to mental health services, especially in rural areas and marginalized communities.

Collaboration between different sectors (including health, education, social services and security) is essential for an approach based on care integrality. Implementing intersectoral programs that involve schools, families and communities can create a more encompassing support environment for adolescents<sup>9,27</sup>. In Brazil, strengthening these collaborations can help build a more efficient support network that is in tune with the adolescents' social and health needs.

Training and qualification of health professionals, educators and others involved in the care provided to adolescents are essential. In this regard, training programs that increase awareness about warning signs and intervention strategies can improve the responses to self-harm behaviors<sup>28</sup>. Thus, investing in training these professionals can result in better assistance and support for at-risk adolescents.

Creating safe and supportive spaces for adolescents to discuss their emotions and experiences is another approach that deserves attention. School counseling programs and peer support groups have proved to be effective in reducing self-harm behaviors<sup>29</sup>. In the national context, implementing listening and welcoming instances and mental health support groups for adolescents in Primary Health Care and school settings can contribute to early identifying risk factors for self-harm behaviors and at-risk adolescents.

Implementing prevention programs that include mental health education in schools can help identify and support at-risk adolescents before self-harm becomes a reality. Training teachers and school personnel to recognize warning signs and offer support can be an effective strategy. In the United Kingdom, programs such as Mental Health First Aid (MHFA) have proved to be promising in training educators to deal with mental health problems among students<sup>29</sup>. In the family context, some studies indicate that promoting parental mental health, open communication and emotional support within the family can strengthen its dynamics, generating a positive impact on preventing self-inflicted violence and on reducing the chances of self-harm behaviors<sup>30</sup>.

It is essential to devise public policies that improve access to mental health services, especially in rural areas and regions with high prevalence of self-inflicted violence. Using digital technologies such as Telehealth and emotional support apps to offer mental health services can be a viable solution to expand reach and impact of the interventions<sup>31</sup>. As adolescents are a captive population immersed in the digital world, involving them in the creation and implementation of digital and even in-person prevention and intervention programs can be a way forward, but lacks planning and legal support. A number of studies show that young people's active participation in mental health programs increases effectiveness and acceptance of these interventions<sup>32,33</sup>. Including adolescents in the development of policies and programs can ensure that their needs and perspectives are considered.

Data from this study highlight the importance of public policies and interventions focused on vulnerable population groups, especially adolescents. The Brazilian context requires approaches that take into account regional, racial and socioeconomic disparities. Implementing prevention and intervention programs that consider these factors can contribute to the quality of adolescents' mental health and, consequently, to reducing self-inflicted violence.

## CONCLUSION

Self-inflicted violence among adolescents in Brazil represents a major Public Health problem, evidenced by the high prevalence of reported cases, especially among females. The analysis of the SINAN data highlights the urgency of implementing public policies that promote mental health and prevent self-harm behaviors in this population group.

Strengthening mental health policies should be a priority, with emphasis on the importance of intersectoral approaches. Integrated actions between the health, education, social assistance and public security sectors are essential to creating a comprehensive support network. In this context, PHC plays a fundamental role in caring for adolescents, providing monitoring over time and identifying social support networks as an aid. Actions such as those developed within the scope of the Health at School Program (*Programa Saúde na Escola, PSE*) are essential to deal with mental health issues in the school setting, offering a safe space for expressing emotions and early identifying risk signs.

Family and community support networks are also vital components in preventing self-inflicted violence. Along with promoting safe and supportive environments, strengthening these ties can significantly contribute to adolescents' emotional well-being. Promoting spaces for dialogue and active listening in schools and communities is fundamental to create an environment where young people feel heard and supported.

With continuous and integrated monitoring of at-risk adolescents, longitudinal care is an essential strategy to prevent self-harm behaviors. The State's role in consolidating strategies to face social media that propagate different types of violence is equally important. As well as promoting educational campaigns on safe social media use, regulating and monitoring these platforms can help mitigate the negative impacts of these media on young people's mental health.

Despite the significant contributions of this study, some limitations should be considered. Having used secondary data from the SINAN may have resulted in not recording the full magnitude of the problem due to under-reporting. Furthermore, the analysis does not address contextual or individual factors such as family environment, history of trauma and socioeconomic conditions, which may exert an influence on self-inflicted violence. Future research studies should incorporate a more comprehensive approach, including psychosocial and cultural factors, to provide a more thorough understanding of the phenomenon.

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#### Author's contributions

Conceptualization, T.F.S.; methodology, T.F.S. and N.S.M.; software, T.F.S. and N.S.M.; validation, T.F.S. and N.S.M.; formal analysis, T.F.S., R.G.S.S. and V.C.S.M.; investigation, T.F.S., R.G.S.S. and V.C.S.M.; resources, T.F.S., R.G.S.S. and V.C.S.M.; data curation, T.F.S.; manuscript writing, T.F.S., R.G.S.S., V.C.S.M., J.F.S. and N.S.M.; review and editing, R.G.S.S., V.C.S.M. and J.F.S.; visualization, R.G.S.S., V.C.S.M. and J.F.S.; supervision, T.F.S., R.G.S.S. and V.C.S.M.; project administration, T.F.S. All authors read and agreed with the published version of the manuscript.

#### Use of artificial intelligence tools

Authors declare that no artificial intelligence tools were used in the composition of the manuscript "*Self-inflicted violence among adolescents in Brazil: An analysis of the notifications made during the 2012-2022 period*".