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Prevalence and social determinants of suicidal ideation among Brazilian public high school students

Prevalência e determinantes sociais da ideação suicida entre estudantes brasileiros em escolas públicas do ensino médio*

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Abstract

Background and Aim: Recent studies have shown an increase in suicidal ideation and behaviors among youths, highlighting solid associations between being poor, being female, being LGBT (lesbian, gay, bisexual, or transgender), and suffering discrimination at school and on the internet. Although the social determinants of suicidal ideation are widely debated worldwide, there is a lack of data on these topics concerning young Brazilians. The present study aimed to contribute to filling this gap. **Method**: The cross-sectional study used a convenience sample of 475 senior high school students (16–17 y-old) from nine public schools in São Paulo, Brazil. **Results**: Of the total interviewed, 224 reported lifetime suicidal ideation, an unexpectedly high prevalence (47.2%). In the multiple analysis with an estimated adjusted prevalence ratio (PR), same-sex or bisexual attraction (PR = 1.87; 95%*CI*: 1.5–2.3), studying in night schools (PR = 1.36; 95%*CI*: 1.1–1.6) — indicative of lower economic status — and being discriminated against at school (PR = 1.22; 95%*CI*: 1.0–1.5) and on the internet (PR = 1.48; 95%*CI*: 1.2–1.8) were positively associated with lifetime suicidal ideation. The students' self-defined race/ethnicity and gender were not. **Conclusions**: The results indicate the need to consider the social determinants of mental health in the public debate and intervention programs aimed at youth in Brazil and elsewhere. Enhancing mental health promotion while considering the sociopolitical determinants of health should be a strategic and political priority. It is crucial to have a comprehensive intersectional perspective that reflects on the various forms of domination and how these connect with mental distress and its consequences.

Keywords: Mental health; Social determinants of health; Social discrimination; Students; Suicidal ideation; Cross-sectional study.

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Resumo

Contexto e Objetivo: Estudos recentes mostram um aumento de ideação e comportamentos suicidas entre jovens, havendo fortes associações com ser pobre, ser mulher, ser LGBT (lésbica, gay, bissexual ou transgénero) e sofrer discriminação na escola e/ou na internet. Embora os determinantes sociais da ideação suicida sejam amplamente debatidos em todo o mundo, há uma lacuna sobre esses temas em relação aos jovens brasileiros, o que o presente estudo pretende contribuir para preencher. **Métodos:** O estudo transversal utilizou uma amostra de conveniência de 475 alunos do ensino médio (16–17 anos) de nove escolas públicas do estado de São Paulo, Brasil. **Resultados:** Do total de entrevistados, 224 deles relataram ideação suicida ao longo da vida, uma prevalência inesperadamente alta (47,2%). Na análise múltipla com estimativa da razão de prevalência (RP) ajustada, atração por pessoas do mesmo sexo ou bissexual (RP = 1,87; *IC*95%: 1,5–2,3), estudar em escolas noturnas (RP = 1,36; *IC*95%: 1,1–1,6) — indicativo de menor condição econômica — e ser discriminado em escola (RP = 1,22; *IC*95%: 1,0–1,5) e na internet (RP = 1,48; *IC*95%: 1,2–1,8) foram associados positivamente à ideação suicida ao longo da vida. Raça/etnia e gênero dos alunos não foram associados. **Conclusões:** Os resultados apontam para a necessidade de consideração dos determinantes sociais da saúde mental no debate público e nos programas de intervenção voltados à juventude no Brasil e em outros lugares. O aprimoramento da promoção da saúde mental, levando-se em conta os determinantes sociopolíticos da saúde, deve ser uma prioridade estratégica e política. É crucial uma perspectiva interseccional abrangente que reflita sobre as várias formas de dominação e como estas se conectam com o sofrimento mental e suas consequências.

Palavras-Chave: Determinantes sociais da saúde; Discriminação social; Estudantes; Ideação suicida; Saúde mental; Estudo transversal.

Introduction

This article discusses the factors associated with the prevalence of suicidal ideation found among public high school students participating in a health promotion intervention study in socially vulnerable areas in São Paulo, Brazil.

Increasing suicide rates among young people in several countries have become a matter of concern within international organizations. Suicide is the second leading cause of death among youth aged between 15 and 29 years around the world, and 77% of suicides worldwide occur in low and middle-income countries (World Health Organization [WHO], 2021).

Suicidal ideation is strongly predictive of suicide deaths (Klonsky et al., 2016). For example, young people who had suicidal ideation at the age of 15 could be nearly 12 times more likely to have attempted suicide by the age of 30 (Reinherz et al., 2006). Because of its predictive characteristic, the presence of suicidal ideation is an essential way of assessing the need for interventions aimed at preventing suicide and promoting mental health among young people (WHO, 2021). Over the last years, the growing dissemination of projects shows the demand for actions to mitigate the worsening mental health indicators observed among young people in several countries. In this regard, schools are considered to provide a crucial point of support for mental health interventions (Murphy et al., 2017).

Economic inequality has been pointed out as a significant social determinant of mental distress, especially in scenarios of increased unemployment and precariousness and flexibility of employment, in conjunction with a lack of social protection policies (Chang et al., 2013). Data covering 1970–2007 from 26 European Union countries showed that every 1% increase in unemployment was associated with a 0.79% rise in suicides at ages younger than 65 (Stuckler et al., 2009). An ecological study conducted in Brazilian state capitals showed that the 24% increase in the rate of adolescent suicide between 2006 and 2015 was positively associated with social inequality (as measured by the Gini index) and unemployment (Jaen-Varas et al., 2019).

Gender inequalities also have consequences relating to the prevalence of suicidal ideation. Suicidal ideation has been described as more frequent among women, while the achievement of the act is more common among men worldwide (Turecki & Brent, 2016). The systematic review of Miranda-Mendizabal et al. (2019), which included 67 studies, showed that female adolescents presented a higher risk of suicide attempts and males presented a higher risk of suicide deaths. This difference can be explained through a gendered perspective on suicidal behavior among men and women since the rates of suicide lethality for women may be attenuated by their greater use of medical and other sources of help and their choice of less-lethal methods (Payne et al., 2008).

Population-based studies have shown that lesbian, gay, bisexual, or transgender (LGBT) people are more vulnerable to mental distress, especially younger individuals (Keuroghlian et al., 2014). The LGBT population in the 10–24 age group is four times more likely to attempt suicide than their heterosexual peers in the USA (Cochran et al., 2013; Lick et al., 2013). Furthermore, almost 32% of LGBT adolescents will attempt suicide (Mustanski & Liu, 2013). In Brazil, as elsewhere, this may be related to the LGBT phobia, commonly present in the family, school, and work spheres (Garcia, 2009).

Reviews of the literature have also highlighted the association between racial discrimination and mental health among young people (Goto et al., 2013). In Brazil, a study based on data from the National Health System (Sistema Único de Saúde) showed that the trend in the suicide mortality rate among black adolescents and young people presented statistically significant growth from 2012 to 2016 (Ministério da Saúde do Governo Federal do Brasil, 2018).

Discrimination and bullying in the school environment are intrinsically linked concepts and are associated with increased suicidal ideation. Positive associations between discrimination, bullying, and suicidal ideation, both in the general population of adolescents and in specific segments (such as LGBT youth), have been described (Kim & Leventjal, 2008). Bullying victims are 1.10 to 5.41 times more likely to have suicidal ideation than individuals who have not been bullied (Katsaras et al., 2018). Analogous to bullying, cyberbullying has been defined as intentional and repeated damage inflicted in various ways on online social media (Hinduja & Patchin, 2010). A positive relationship between peer cyberbullying victimization and suicidal ideation and attempts has been reported (van Geel et al., 2014).

Although the social determinants of suicidal ideation are widely debated worldwide, there is a lack of data on these topics concerning young Brazilians since a biomedical approach guided most studies designed in the country. The present study aims to contribute to filling this gap by analyzing the suicidal ideation among Brazilian youths and its association with being poor, female, LGBT (lesbian, gay, bisexual, or transgender), and suffering discrimination at school and on the internet.

Methods

Procedures, Participants, and Instrument

This cross-sectional study is part of a Brazilian intervention project that began in 2019. The main project focuses on human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and intimate partner violence, with the intent of evaluating whether the intervention would increase safer sex and access to contraception tools, post-exposure prophylaxis (PEP), and testing and treatment for sexually

transmitted infections (Paiva et al., 2021). It takes place in five regular high schools and four technical schools (ETEC) in three cities in São Paulo State (São Paulo, Santos, and Sorocaba).

After our institution's ethics committee had approved the consent process, the preliminary questionnaire was answered by a sample of 475 students aged 16–17 in their last high school year, just before graduation, between October and December 2019. Tablets or school computers (when available) were used in specially prepared classrooms so students could answer the structured questionnaire in privacy. The questions covered the access to and use of healthcare services; their participation in youth groups/collectives; internet use; discrimination on the internet and at school; sexual initiation and sexually transmitted disease/AIDS and pregnancy prevention; and mental health issues. The last part is the focus of this paper.

The dependent variable analyzed in this study was suicidal ideation over the lifetime, which was categorized as "yes" or "no" to the question "Have you ever seriously thought about ending your life?"

The independent variables were school location ("São Paulo", "Sorocaba" or " Santos); type of high school ("regular", "technical-integrated" or "technical high"); period of the day in which school was attended ("morning/afternoon" or "knighted Q1"); work and/or internship (“yes” or “no”); “paid work or internship” (“yes” or “no”); “mother's education level” (“up to complete elementary school”, “incomplete or complete high school”, “incomplete and complete college/university”; and “after college/university education ”); self-defined skin color or ethnicity ("white", "black (black or brown)" or "East Asian or indigenous"); self-identified gender ("male" or "female"); sexual attraction ("person of the same sex" or “both sexes” and "only person of the opposite sex"; episode of discrimination on the internet and school (yes” or “no”). The question on self-identified gender was: “How do you self-identify?” (“Woman”, “Man”, “I self-identify otherwise”). Two students answered “otherwise”, and this category was excluded from this analysis.

Analytical Strategy

All the variables were described using absolute and relative frequencies. Pearson' s chi-square test or Fisher’s exact test (if cell size was below five) were used to test the association between variables. The significance level was taken to be 5%.

A Poisson model with robust variance was used in an exploratory analysis of factors associated with suicidal ideation. This model was used because this was a cross-sectional study in which the prevalence of the outcome was greater than 10%. Thus, using a Poisson model avoids the overestimation of the indicator and allows better adjustment of the confidence interval (Barros & Hirata, 2003). The multiple analysis included the above variables that presented $p < .20$ in bivariate analysis. In addition, the variables that showed $p < .05$ or that adjusted the other independent variables by at least 10% were kept in the final model. The model fit was tested using the goodness-of-fit test and receiver operating characteristics (ROC) curve. All statistical analyses were performed using the Stata software (Version 14).

Results

Half of the young people in the sample were living in the city of São Paulo. Most were attending regular (non-vocational) education in the mornings or afternoons and were not working or in a paid internship. Approximately 69.4% of the young people's mothers had a lower level of education at the time of data collection, a strong indicator for understanding youth social environments and socioeconomic differences in

Brazil (Heilborn et al., 2006). As described in Table 1, the proportions of students who self-defined as white and black or brown were similar, and only a few students (1.9%) self-identified otherwise. Most students identified themselves as female. Although most boys and girls indicated that they were attracted to people of the opposite sex, a substantial number stated that they had non-heterosexual desires. More girls than boys (48.7% non-heterosexual and 51.4% heterosexual among the girls vs. 16.5% non-heterosexual and 83.5% heterosexual among the boys; $p < .001$) indicated non-heterosexual desire. Lastly, most of the students had not experienced episodes of discrimination at school and on the internet in the last 12 months.

Table 1

Frequencies of the Characteristics of the Total Sample and Suicidal Ideation, São Paulo (2019)

	Total sample		Suicidal Ideation				
			No		Yes		
Variables	*N*	%	*n*	%	*n*	%	χ^2
Type of high school							49.08
Regular	366	77.2	184	50.3	182	49.7	
Technical-integrated	97	20.5	61	62.9	36	37.1	
Technical high	11	2.3	6	54.6	5	45.5	
Period of the day in which school was attended [a]							44.20*
Morning/afternoon	423	89.6	231	54.6	192	45.4	
Evening	49	10.4	19	38.8	30	61.2	
School location [a]							59.61*
São Paulo	235	55.8	116	49.4	119	50.6	
Sorocaba	104	24.7	62	59.6	42	40.4	
Baixada Santista	82	19.5	52	63.4	30	36.6	
Paid work or internship [a]							0.47
No	375	79.3	202	53.9	173	46.1	
Yes	98	20.7	49	50.0	49	50.0	
Self-defined skin color or ethnicity [a]							13.55
White	231	48.7	116	50.2	115	49.8	
Black or Brown	234	49.4	130	55.6	104	44.4	
East Asian or indigenous	9	1.9	5	55.6	4	44.4	
Self-identified gender [a]							124.56***
Female	281	59.7	131	46.6	150	53.4	
Male	190	40.3	120	63.2	70	36.8	
Sexual attraction [a]							469.06***
Person of the opposite sex	275	64.1	182	66.2	93	33.8	
Both sexes/only person of the opposite sex	154	35.9	49	31.8	105	68.2	
Episode of discrimination on the internet [a]							278.52***
No	310	76.4	192	61.9	118	38.1	
Yes	96	23.7	30	31.3	66	68.8	
Episode of discrimination on the school [a]							213.54***
No	330	80.3	200	60.6	130	39.4	
Yes	81	19.7	26	32.1	55	67.9	
Mother's education level [a]							32.64
Up to complete elementary school	115	25.0	54	47.0	61	53.0	
Incomplete/complete high school	205	44.5	111	54.2	94	45.9	
Incomplete/complete college/university	97	21.0	56	57.7	41	42.3	
After college/university education	44	9.5	26	59.1	18	40.9	

Notes. $N = 474$; χ^2 = Chi-square test.
[a] Not all subjects answered all the questions.
*$p < .05$. ***$p < .001$.

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Out of the total number of students (*n* = 475), 47.2% reported having had some suicidal ideation throughout their lives. By testing the association between suicidal ideation and students' characteristics, a higher frequency of suicidal ideation was observed among those who studied at night and in the city of São Paulo (Table 1). Also, there was a higher frequency of suicidal ideation among female students, students attracted to people of the same sex, and students who had experienced discrimination at school or on the internet. However, there were no statistically significant differences concerning the other variables.

In the bivariate analysis of the Poisson model, positive associations with suicidal ideation were observed with the following variables: 'Period of the day in which school was attended,' 'School location - São Paulo,' 'Self-identified gender,' 'Sexual attraction,' 'Episode of discrimination on the internet' and 'Episode of discrimination on the school.' Thus, there was more significant suicidal ideation among students who studied at night and lived in the city of São Paulo; students who self-identified as female; those who were attracted to people of the same gender, and those who had experienced discrimination at school or on the internet (Table 2).

Table 2

Prevalence Ratio of the Suicidal Ideation, São Paulo (2019)

	Suicidal Ideation			
	Bivariate		Multiple	
Variables	PR_{crude}	*CI*95% (*LL*–*UL*)	PR_{adj}	*CI*95% (*LL*–*UL*)
Type of high school				
Technical high	1.00	—	NS	—
Regular	1.09	(0.5–2.1)	NS	NS
Technical-integrated	0.81	(0.4–1.6)	NS	NS
Period of the day in which school was attended				
Morning/afternoon	1.00	—	1.00	—
Evening	1.35	(1.0–1.7)*	1.36	(1.1–1.6)*
School location - Sao Paulo				
No (Sorocaba, Baixada Santista)	1.00	—	NS	—
Yes, São Paulo	1.31	(1.0–1.6)*	NS	NS
Self-identified gender				
Male	1.00	—	NS	—
Female	1.45	(1.2–1.8)*	NS	NS
Sexual attraction				
Person of the opposite sex	1.00	—	NS	—
Both sexes" and "only person of the opposite sex	2.01	(1.6–2.4)***	1.87	(1.5–2.3)***
Episode of discrimination on the internet				
No	1.00	—	NS	—
Yes	1.81	(1.5–2.2)***	1.48	(1.2–1.8)***
Episode of discrimination on the school				
No	1.00	—	NS	—
Yes	1.72	(1.4–2.1)***	1.22	(1.0–1.5)*

Note. *N* = 474; PR_{crude} = Crude prevalence ratio; PR_{adj} = Adjusted prevalence ratio; *CI* = confidence interval; *LL*–*UL* = lower/upper limit. *NS* = Non-significant. *p < .05. ***p < .001.

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After adjusting the variables in the multiple analysis (Table 2), the same positive associations as in the bivariate analyses were observed, except for the city where the students were studying and gender, which lost their statistical significance after the adjustment of the variables. Remarkably, gender lost statistical significance after including the sexual attraction variable. Nevertheless, studying in São Paulo was maintained in the final model because it adjusted episodes of discrimination at school. Thus, in the final model, positive associations were observed between suicidal ideation and attraction to people of the same sex, studying at night, and experiencing discrimination at school and on the internet (Table 3). The final model had a good fit, with a goodness-of-fit test of 0.92. This model also explained 74.1% [95%*CI*: 0.70–0.77] of the outcome variance.

Discussion

Although there is a lack of comprehensive studies addressing suicide in youth in Brazil (Piccin et al., 2020), the prevalence of suicidal ideation among senior high school students in our study (47.2%) may be considered high. Botega et al. (2009), based on a similar question on lifetime suicidal ideation, found the prevalence was 8.3% for adolescents (14 to 19 years old) in Campinas, Brazil. In the USA, a national survey based on a similar question found that the prevalence of lifetime suicidal ideation was approximately 14% among 16–year-old students and 16% among 17–year-old students (Nock et al., 2013).

A meta-analysis by Lim et al. (2019) showed great methodological diversity among the studies on suicidal ideation among children and young people, which hinders precise comparisons between different geographical contexts. Despite this, from the 33 studies focusing on suicidal ideation worldwide, these authors estimated that the aggregate prevalence of lifetime suicidal ideation among children and young people was 18%, 95%*CI*: 14.2–22.7%.

The association between studying at night and higher frequencies of suicidal ideation in our study suggests that socioeconomic differences may be associated with higher levels of mental distress. Night schools for adolescents are typical of countries of peripheral capitalism, and this has been much less studied than other factors analyzed in the present study. Young people seek to continue their schooling while working because of the living conditions of their families. Night students live in worse economic conditions (Sousa & Oliveira, 2008).

The positive association between having same-sex attraction and suicidal ideation may be related to the presence of LGBT phobia in school. LGBT youths frequently face adversities at school relating to their gender identity and sexual orientation (Lindsey et al., 2013). They commonly feel unsafe and insecure in school; for many of them, schools are a place of bullying and harassment (Cray et al., 2013), making them more vulnerable to mental distress. This occurs mainly in the absence of programs or actions to combat homophobia in the school context (Hatzenbuehler et al., 2014; Kosciw et al., 2014). Discrimination at school and on the internet mirrors inequalities based on gender, sexuality, race/ethnicity, class, and physical disability faced in daily life (Ansary, 2020; Cohen-Almagor, 2018). The positive association observed between discrimination suffered within the school environment and suicidal ideation is concordant with data in the literature that stresses the need to prevent it.

Discrimination in the school context has consequences on academic performances, school dropout, and mental distress (Kim & Leventjal, 2008; Moore et al., 2017). The positive association between discrimination on the internet and suicidal ideation was also concordant with the literature that stresses its significant impact on young people's mental health. Given that on the internet, the material posted by the perpetrators often remains available for extended periods, this increases the victims' exposure time, which relates to their higher incidence of distress (Ferreira & Deslandes, 2018). In addition, fake profiles and anonymity provide perpetrators with a safe environment that protects them from the consequences of their words, which stimulates increasingly violent acts (Ansary, 2020). Being female was associated with lifetime suicidal ideation in the bivariate analyses but lost statistical significance after adjusting the variables by including the sexual attraction variable. In psychosocial approaches, the mental distress associated with gender has been understood as an expression of the oppression historically directed at women (Showalter, 1987). Furthermore, being female had been associated with worse psychological health in longitudinal studies on the social determinants of mental health (Silva et al., 2016).

The present study observed no association between race/ethnicity and suicidal ideation. Nevertheless, it is crucial to consider that massive exposure to racism, a legacy of slavery and colonialism, can intensify coping mechanisms. One of these is the necessity to demonstrate strength and suppress emotions (Knighton et al., 2020), leading to lower reporting of mental distress.

Limitations

It is important to emphasize that the present study was conducted using a convenience sample, which may have resulted in selection bias and, consequently, an overestimation of the prevalence. Nonetheless, the model used in our study presented a power of 99% with an alpha of 5% for the observed prevalence of suicidal ideation, which therefore emphasizes the relevance of our findings and the sample used. In addition to the analyzed power, we consider that selection bias was minimized because the main objective of the more extensive study was not the outcome of the present study, which consequently did not induce or intimidate participation due to the theme of suicidal ideation. Also related to the result, we cite the possible memory bias due to the formulation of the question, which referred to lifetime suicidal ideation. Lastly, this study was cross-sectional, making it difficult to interpret the causal relationship between risk factors and the outcome. Despite these study limitations, it was possible to identify associated factors among Brazilian public-school students consistent with the international literature highlighting social vulnerability for suicidal ideation.

Conclusion

The prevalence of suicidal ideation over a lifetime may be considered high among these senior Brazilian high-school students living in impoverished areas. Its positive association with studying at night, an indicator of lower socioeconomic status, shows the importance of understanding how inequalities experiences increase mental distress. The consequences of the multiple forms of

discrimination for mental health distress are also highlighted by the results concerning having bisexual or same-sex attraction (possibly being exposed to LGBT-phobia) and reporting previous incidents of discrimination at school or on the internet.

Enhancing mental health promotion while considering the sociopolitical determinants of health should be a strategic and political priority. Reducing the neglect of adolescents' rights that sustains inequalities and structural stigma and discrimination is one condition for creating nonviolent and respectful relationships that support life with dignity, mental health, and well-being. Furthermore, as observed in our research process, it is essential to highlight that dissemination of information about mental health has been growing on the internet. Therefore, it constitutes an opportunity to promote a welcoming online solidarity environment (Paiva et al., 2021).

To improve mental healthcare and health promotion, it is essential to bring together the agendas of organized social movements that discuss the various forms of inequalities and oppression based on class, sex, gender identity, and race/ethnicity, among others (Garcia, 2019). Moreover, the struggle for human rights-based mental health promotion needs to take place within a comprehensive intersectional perspective that reflects on the various forms of domination and how these connect with mental distress and its consequences.

Conflict of interest | Conflito de interesses: The authors declare that there is no conflict of interest.

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