



# Suicide Attempt and Its Correlates Among School-Going Argentinian Adolescents with Suicidal Thoughts: Insights from a National Survey

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## Abstract

A combination of personal, psychological, and environmental factors contributes to the risk of suicide attempts among those with suicidal thoughts and warrants further research. The study explored the associations of demographic, psychosocial, and behavioral factors with suicide attempts among a nationally representative of school-going Argentinian adolescents who have suicidal thoughts. The study analyzed the data from the Argentina Global School-based Students Survey 2018. The sample was restricted to adolescents with suicidal thoughts. The chi-square test was used to examine the association, and logistic regression determined the odds of suicide attempts across risk factors including demographic factors, psychosocial and environmental risks, as well as substance use and risk sex behaviors. In total, 11,962 (21.46%) of school-going Argentinian adolescents had suicidal thoughts, of whom 6033 (51.67%) had suicide attempts at least once in the last 12 months. Findings indicated that female adolescents had higher odds of attempts, paralleling global trends, while grade differences suggested a transitional phase's significance. Among those with suicidal thoughts, psychosocial factors like loneliness, bullying, and school absenteeism played pivotal roles in enhancing the odds of suicide attempts. In addition, substance use, notably marijuana, amphetamines, alcohol, and early initiation were associated with a heightened risk of suicide attempts. Risky sexual behaviors, like early activity and multiple partners, were also associated with a higher likelihood of suicide attempts in suicide ideators. Emphasizing preventive measures targeting adolescents, particularly within school settings, is crucial for reducing suicide attempts among those experiencing suicidal thoughts.

**Keywords** Suicide attempt · Suicide thoughts · Argentina · Adolescents

## Introduction

Suicide is a major public health issue, especially among adolescents, as it represents a major cause of morbidity and mortality in this age group (Brent, Horowitz et al. 2023). In Argentina, the prevalence of suicidal thoughts and attempts among 13–17 years old students attending school in 2018 was 21.5% and 15.2%, respectively (Organization 2018). A range of factors have been linked to suicide attempts in Latin American youth, including psychological distress, sleep problems due to anxiety (Pengpid & Peltzer 2019), lack of close friendships, loneliness (Sharma, Nam

et al. 2015, Pengpid & Peltzer 2022), and non-suicidal self-harm (Richardson, Connell et al. 2024). Key contributors to adolescent suicidal behaviors include drug use, mental disorders, alcohol use, low economic status, dysfunctional relationships with parents, and experiences of violence (Mauro et al., 2022). In addition, risky behaviors such as being offered illegal substances at school and being abused by a partner are also reported as significant risk factors for suicidal behaviors (Bae, Ye et al. 2005). Taken together, these underscore the complex interplay of individual, social, and cultural factors in adolescent suicide attempts and the necessity of understanding the unique sociocultural and behavioral processes influencing adolescent suicide attempts in developing targeted prevention and intervention programs (Zayas, Lester et al. 2005).

Moreover, the capability to attempt suicide, including acquired capability and a high tolerance for pain and distress, is a key differentiator between suicide attempters and ideators (Klonsky, Qiu et al. 2017). Previous research proposed

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a stress-diathesis model, suggesting that the risk for suicidal acts is influenced by both psychiatric illness and individual tendencies such as suicidal ideation and impulsivity (Mann, Wateraux et al. 1999). This model posits that individuals with a diathesis or predisposition to suicidal behavior, such as genetic factors or early life adversity, are more likely to engage in suicidal acts when exposed to stressful life events or mental health problems (Oquendo, Perez-Rodriguez et al. 2014). In a population-based birth cohort study, the strongest predictors of transition to suicide attempts among participants with suicidal thoughts were non-suicidal self-harm, cannabis use, other illicit drug use, and exposure to self-harm (Mars, Heron et al. 2019). Beautrais (2000) further emphasized the role of mental disorders and psychopathology in youth suicide, highlighting the need for interventions focused on recognizing and treating these conditions (Beautrais 2000). These studies collectively suggest that a combination of personal, psychological, and environmental factors contributes to the risk of suicide attempts among those with suicidal thoughts and warrants further research to develop more effective prevention and intervention strategies targeting this high-risk group.

In Argentina, a cross-sectional study on the frequency and correlates of suicide attempts found that younger adolescents attending school (13–15 years old) had higher odds of multiple suicide attempts as compared to other age groups. This study also showed that the odds of multiple suicide attempts (MSA) were increased by interpersonal violence, low parental support, and substance use among girls, and by having multiple sexual partners among boys (Pengpid & Peltzer 2022). However, the study did not specify the risk factors that can predict suicide attempts among suicide ideators who are the most vulnerable and at heightened risk of suicide. This is a critical gap in the literature, as individuals with suicidal ideation are at significantly higher risk for attempting suicide compared to the general population (Canady 2020, Wiebenga, Eikelenboom et al. 2021, Hargu, Cho et al. 2023). Additionally, to provide a broader context, it is also important to consider the nuances between sociocultural contexts (Amitai & Apter 2012). Sociocultural factors may influence family dynamics and social interaction as well as the coping mechanism among adolescents, thereby influencing adolescent mental health and suicidal behaviors differently in diverse cultural contexts (Beautrais 2000, Swahn, Bossarte et al. 2010). While some psychosocial factors, such as economic disparities and lack of family support, are universal, others like acculturative stress and protective factors vary across cultures (Goldston, Molock et al. 2008). This suggests that while some risk factors for suicidal behaviors may be consistent across different sociocultural settings, there may also be unique nuances shaped by contextual sociocultural factors. It is, therefore, crucial to understand the context-specific risk factors and correlations

of suicidal behaviors among Argentinian adolescents for timely diagnosis and intervention.

Against this background, this study seeks to fill this gap by exploring the nuanced interplay of demographic characteristics, psychosocial factors, and health risk behaviors in predicting suicide attempts among school-going Argentinian adolescents with suicidal thoughts. Findings will provide valuable insights into the factors that contribute to suicide attempts in this population, which can help inform targeted interventions and prevention strategies. By conducting a comprehensive analysis of these factors, this study will contribute to the existing literature on suicide attempts in adolescents and help identify potential areas for intervention and research.

## Methods

### Data Source

This study used data from Argentina's 2018 GSHS (Global School-based Student Health Survey), a nationally representative survey of students in the 8–12th grade. The GSHS collects information on health behaviors and protective factors among school-going adolescents across multiple countries. Argentina GSHS 2018 recruited a representative sample of students in 8th grade (Primary/Polymodal Schools) to 12th grade (Polymodal Schools). In the first phase, schools were randomly selected based on their size. In the second phase, all students in the same class were invited to complete a self-administered questionnaire in Spanish. The response rate for schools was 86% and for students was 74%, resulting in a total response rate of 63% [11]. A total of 56,898 adolescents in 8–12th grades completed the survey. However, for the purpose of the present study, we only included those with suicidal thoughts to identify the factors that increase the odds of suicide attempts among this vulnerable population. Of note, suicidal thoughts were measured by asking participants if they had ever seriously considered suicide in the previous year.

### Outcome Variable

The suicide attempt was measured by asking participants how many times they had attempted suicide in the past year. The answer was coded as “yes” or “no.”

### Independent Variables

Based on a comprehensive literature review, theoretical relevance, and availability of related questions in Argentina GSHS 2018, a set of variables was selected and included in this study. We chose to code predictors as binary variables to

facilitate interpretability, ease of analysis, and comparability across studies. Further analysis showed that the likelihood of suicidal attempts increased consistently for categories higher than 1 compared to the reference category of 0. Thus, we combined higher frequency categories into binary variables to enhance statistical power and interpretability.

### Demographic Variables

Age (> 14, 14–15,  $\geq$  16), sex (male, female), grade level (8–12th).

### Psychosocial and Environmental Factor

The loneliness and anxiety-induced insomnia were measured by asking the question “In the past year, how frequently did you feel lonely?” and “In the past 12 months, how often were you so anxious about something that you couldn’t sleep at night?”, respectively, and the responses were coded as 1 “yes” (most of the time/always) and 0 “no” (never/rarely/sometimes). Physical attack and fight were measured by asking “In the past 12 months, how many times were you physically attacked/ were you in a physical fight?” Answers were coded as 0 (no) or 1 (yes). Traditional bullying was assessed by asking participants two questions: “In the past 12 months, were you ever bullied on school grounds?” and “In the past 12 months, were you ever bullied when not on school grounds?”. The responses to these questions were combined to create a binary variable for bullying with the categories 1 for “yes” and 0 for “no.” Cyberbullying was measured by asking the question “In the past 12 months, were you ever cyberbullied? (Count being bullied through texting, Instagram, Snapchat, Facebook, WhatsApp, Edmodo, Messenger, or other social media.)” The response options were binary with 1 for “yes” and 0 for “no.” Truancy was measured by asking students “Over the past 30 days, how many days did you skip classes or school without permission?”. Students who missed any days of school were considered to be truant so responses were coded as 0 for “no” (no days missed) and 1 for “yes” (missed at least 1 day). Low parental connectedness was assessed by asking “Over the past 30 days, how often did your parents or guardians understand your problems and worries?”. Responses were categorized as 1 “yes” representing never/rarely/sometimes and 0 “no” representing always/often. Peer connectedness was measured by asking students “How many close friends do you have?”. Having at least one close friend was considered desirable, so responses were coded as 1 for “yes” (has at least 1 close friend) and 0 for “no” (has no close friends). Low parental awareness was assessed by asking “In the past 30 days, how often did your parents know what you were doing in your free time?” Answers were coded 1 “yes” indicating never/rarely and 0 “no” indicating most of the time/always. Food insecurity

was assessed by asking “During the past 30 days, how often did you go hungry because there was not enough food in your home?” and responses were coded as 1 for “yes” (most of time/always) and 0 for “no” (never, rarely, sometimes). No physical activity was assessed by asking “During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?” and responses were coded as 1 “yes” and 0 “no.”

### Substance Use

Ever using amphetamine was coded 0 (no) or 1 (yes). Age at first drug/cigarette/alcohol use was coded 0 (< 14 years) or 1 (14+ years). Current cigarette/tobacco/alcohol use was coded 0 (no) or 1 (yes). Getting drunk or drinking-related trouble was measured by asking ‘How many times have you been really drunk?’ and ‘How many times has your drinking caused trouble with family/friends, missing school, or fights?’ Answers were coded 0 (never) or 1 (yes).

### Sex Risk Behaviors

Ever having sex was coded 0 (no) or 1 (yes). Age at first sex was coded 0 (< 14 years) or 1 (14+ years). The number of sexual partners was measured by asking ‘With how many people have you had sex?’ Answers were coded as binary (yes = 1; no = 0). Condom use at last sex was coded 0 (no) or 1 (yes).

### Statistical Analysis

The study utilized descriptive statistics to report the distribution of demographic, psychosocial, environmental, substance use, and sexual risk behavior variables, as well as the prevalence of suicide attempts, among Argentinian adolescents in grades 8–12th who reported suicidal thoughts. Logistic regression analysis was used to examine the odds of suicide attempt across potential explanatory variables, controlling for age and sex. This approach enabled the estimation of the independent effects of the study variables on suicide attempts, regardless of potential confounding by age and sex (Mars, Heron et al. 2019, Dadras & Wang 2023). It, therefore, allowed us to identify the potential predictors of suicide attempt among suicide ideators and develop targeted school-based interventions and prevention strategies for all students experiencing suicidal thoughts. The missing data were treated in a listwise manner by dropping the case with incomplete data. The survey sampling design and weights were applied by defining the strata, primary sampling units, and weights using STATA 17. The results were reported as frequency (%) for descriptive analysis and adjusted odds ratios (AORs) and 95% confidence intervals (CIs) for regression analysis. Statistical significance was defined as  $p < 0.05$ .

## Results

In total, 11,962 (21.46%) of school-going Argentinian adolescents had suicidal thoughts, of whom 6033 (51.67%) had suicide attempts at least once in the last 12 months.

### Demographic Characteristics and Suicide Attempts Among Suicide Ideators

Overall, age groups 14–15 and ≥ 16 did not exhibit substantial variations in suicide attempts when compared to the under 14 group ( $p=0.403$ ). Female adolescents showed significantly higher odds of suicide attempts compared to males (OR: 1.57, 95% CI: 1.32–1.86). Suicide attempt rates significantly varied across grades ( $p=0.005$ ) and grades 9th through 12th displayed significantly lower odds of suicide attempts compared to the 8th grade (Table 1).

### Psychosocial and Environmental Factors and Suicide Attempts Among Suicide Ideators

Table 2 describes the association of psychosocial and environmental factors with suicide attempts among adolescents with suicidal thoughts. Adolescents reporting feelings of loneliness had higher odds of suicide attempts (OR: 1.79, 95% CI: 1.45–2.20). Those experiencing anxiety-induced

**Table 1** Demographic characteristics and suicide attempts among Argentinian adolescents with suicidal thoughts

Variable	Suicidal thoughts		Suicide attempt	
	N (weighted%) <sup>a</sup>	N (weighted%) <sup>b</sup>	OR (95%CI)	
Age group				
< 14	2086 (19.89)	1137 (54.37)	Ref	
14–15	5632 (48.25)	2852 (51.44)	0.89 (0.72–1.10)	
≥ 16	4228 (31.86)	2035 (50.32)	0.85 (0.67–10.9)	
<i>p</i> value		0.403		
Sex				
Male	3682 (30.84)	1550 (43.78)	Ref	
Female	8149 (69.16)	4403 (54.93)	1.57 (1.32–1.86)*	
<i>p</i> value		< 0.001		
Grade				
8th	1701 (14.12)	1002 (60.86)	Ref	
9th	2528 (26.35)	1376 (52.15)	0.70 (0.53–0.94)*	
10th	2795 (25.34)	1373 (52.44)	0.71 (0.58–0.87)*	
11th	2850 (19.61)	1347 (45.34)	0.53 (0.43–0.67)*	
12th	1893 (14.57)	832 (48.23)	0.60 (0.43–0.84)*	
<i>p</i> value		0.005		

<sup>a</sup>Those who have suicidal thoughts

<sup>b</sup>Among those with suicidal thoughts

\* $p < 0.05$

**Table 2** Psychosocial and environmental factors and suicide attempts among Argentinian adolescents with suicidal thoughts

Variable	Suicide attempt		
	N (weighted%)	N (weighted%)	AOR (95%CI) <sup>a</sup>
Felt lonely			
No	6685 (56.67)	2914 (45.08)	Ref
Yes	5214 (43.33)	3089 (60.34)	1.79 (1.45–2.20)*
<i>p</i> value		< 0.001	
Anxiety-induced insomnia			
No	8166 (68.45)	3708 (45.97)	Ref
Yes	3719 (31.55)	2287 (63.86)	2.01 (1.71–2.35)*
<i>p</i> value		< 0.001	
Traditional and cyberbullied			
No	8612 (72.29)	4067 (48.81)	Ref
Yes	3321 (27.71)	1948 (58.90)	1.46 (1.29–1.65)*
<i>p</i> value		< 0.001	
Physically attacked			
No	8296 (68.44)	3783 (46.25)	Ref
Yes	3606 (31.56)	2218 (62.98)	2.01 (1.72–2.45)*
<i>p</i> value		< 0.001	
Physical fights			
No	8240 (67.25)	3799 (46.08)	Ref
Yes	3658 (32.75)	220 (62.81)	2.28 (1.91–2.72)*
<i>p</i> value		< 0.001	
Truancy			
No	7352 (63.22)	3484 (49.02)	Ref
Yes	4222 (36.78)	2354 (55.78)	1.34 (1.14–1.58)*
<i>p</i> value		< 0.001	
Low parent-connectedness			
No	8903 (77.46)	4601 (52.90)	Ref
Yes	2606 (22.54)	1224 (47.35)	1.23 (1.05–1.44)*
<i>p</i> value		0.004	
Low peer connectedness			
No	10672 (91.39)	5369 (51.14)	Ref
Yes	2067 (8.61)	560 (54.85)	1.19 (0.91–1.55)
<i>p</i> value		0.245	
Low parental awareness			
No	7082 (61.12)	3930 (55.76)	Ref
Yes	4510 (38.88)	1933 (45.35)	1.55 (1.34–1.78)*
<i>p</i> value		< 0.001	
Food insecurity			
No	11390 (95.7)	5665 (50.68)	Ref
Yes	470 (4.30)	304 (71.96)	2.70 (1.87–3.92)*
<i>p</i> value		< 0.001	
No physical activity			
No	9394 (78.03)	4737 (51.97)	Ref
Yes	2294 (21.97)	1153 (50.30)	0.91 (0.77–1.08)
<i>p</i> value		0.432	

<sup>a</sup>Adjusted for age and sex

\* $p < 0.05$

insomnia exhibited twofold higher odds of suicide attempts. Victims of traditional and cyberbullying demonstrated were more likely to attempt suicide (OR: 1.46, 95% CI: 1.29–1.65,  $p < 0.001$ ). The likelihood of suicide attempts was more than two times higher among adolescents subjected to physical attacks and engaged in physical fights. Truancy and low parental connectedness were more likely to attempt suicide (OR: 1.34, 95% CI: 1.14–1.58 and OR: 1.23, 95% CI: 1.05–1.44, respectively). Low parental awareness was associated with 1.5 times higher odds of suicide attempts. Adolescents experiencing food insecurity displayed substantially higher odds of suicide attempts (OR: 2.70, 95% CI: 1.87–3.92). Low peer connectedness and no physical activity did not show statistically significant associations with suicide attempts.

### Substance Use and Suicide Attempts Among Suicide Ideators

As Table 3 illustrates, adolescents engaging in recent marijuana use had a nearly twofold increase in the odds of suicide attempts (OR: 1.89, 95% CI: 1.62–2.21). Those with a history of using amphetamines showed notably higher odds of suicide attempts (OR: 3.19, 95% CI: 2.16–4.72). Adolescents currently using cigarettes had nearly two times higher likelihood of attempting suicide. Similarly, those presently consuming alcohol were more likely to attempt suicide (OR: 1.60, 95% CI: 1.39–1.85, respectively). Initiating substance use at an early age (< 14 years) exhibited increased odds of suicide attempts, specifically for cigarette initiation (OR: 1.49, 95% CI: 1.20–1.85) and alcohol consumption (OR: 1.35, 95% CI: 1.11–1.63). Adolescents with a history of ever using drugs (OR: 1.86, 95% CI: 1.26–2.76) or being troubled by drunkenness (OR: 1.67, 95% CI: 1.40–1.99) exhibited higher odds of suicide attempts.

### Risky Sex Behaviors and Suicide Attempts Among Suicide Ideators

Table 4 illustrates the association of sex risk behaviors with suicide attempts among adolescents with suicidal thoughts. Adolescents who had engaged in sexual activity showed a higher likelihood of attempting suicide (OR: 1.73, 95% CI: 1.52–1.98). Those who initiated sexual activity before age 14 displayed almost 1.5 times higher likelihood of suicide attempts. Additionally, having multiple sexual partners was associated with a higher likelihood of attempting suicide (OR: 1.75, 95% CI: 1.49–2.05). However, no significant association was observed between not using condoms in the last sexual encounter and suicide attempts (OR: 1.06, 95% CI: 0.78–1.43).

**Table 3** Substance use and suicide attempts among Argentinian adolescents with suicidal thoughts

Variable	Suicide attempt		
	N (weighted%)	N (weighted%)	AOR (95%CI) <sup>a</sup>
<b>Recent marijuana use</b>			
No	9851 (85.09)	4780 (49.21)	Ref
Yes	1749 (14.91)	1051 (62.98)	1.89 (1.62–2.21)*
<i>p</i> value	< 0.001		
<b>Ever amphetamine use</b>			
No	11003 (94.69)	5407 (49.84)	Ref
Yes	585 (5.31)	407 (73.86)	3.19 (2.16–4.72)*
<i>p</i> value	< 0.001		
<b>Use drugs at age &lt; 14<sup>b</sup></b>			
No	1616 (60.20)	852 (54.3)	Ref
Yes	1039 (39.80)	665 (68.56)	1.86 (1.26–2.76)*
<i>p</i> value	< 0.001		
<b>Current cigarette use</b>			
No	7930 (67.95)	3599 (45.87)	Ref
Yes	3876 (32.05)	2348 (63.46)	2.05 (1.72–2.43)*
<i>p</i> value	< 0.001		
<b>Age at cigarette initiation &lt; 14<sup>c</sup></b>			
No	4460 (67.93)	2646 (62.32)	Ref
Yes	2288 (32.07)	1139 (51.97)	1.49 (1.20–1.85)*
<i>p</i> value	< 0.001		
<b>Currently drink alcohol</b>			
No	3918 (34.96)	1726 (44.16)	Ref
Yes	7607 (65.04)	4111 (55.99)	1.60 (1.39–1.85)*
<i>p</i> value	< 0.001		
<b>History of drunk (lifetime)</b>			
No	5709 (50.34)	2590 (45.86)	Ref
Yes	5811 (49.66)	3216 (57.52)	1.67 (1.40–1.99)*
<i>p</i> value	< 0.001		
<b>Troubling drunk</b>			
No	9039 (78.75)	4223 (47.96)	Ref
Yes	2580 (21.25)	1628 (64.41)	2.01 (1.62–2.48)*
<i>p</i> value	< 0.001		
<b>Age at first drink &lt; 14<sup>d</sup></b>			
No	2996 (28.23)	1437 (48.66)	Ref
Yes	6701 (71.77)	3662 (55.75)	1.35 (1.11–1.63)*
<i>p</i> value	0.004		

<sup>a</sup>Adjusted for age and sex

<sup>b</sup>Among those who had ever used drugs (using marijuana, amphetamines, cocaine, inhalants, cocaine, crack, ecstasy, glue, and ganja)

<sup>c</sup>Among those who had ever used cigarette

<sup>d</sup>Among those who had ever drunk

\* $p$  value < 0.05

## Discussion

This study uniquely investigates the factors associated with suicide attempts among Argentinian adolescents who have

**Table 4** Risky sex behaviors and suicide attempts among Argentinian adolescents with suicidal thoughts

	N (weighted%)	N (weighted%)	AOR (95%CI) <sup>a</sup>
Ever had sex			
No	5682 (51.04)	2590 (45.88)	Ref
Yes	5701 (48.96)	3118 (56.42)	1.73 (1.52–1.98)*
<i>p</i> value		< 0.001	
Age at first sex < 14 <sup>b</sup>			
No	3261 (61.09)	1676 (53.12)	Ref
Yes	1961 (38.91)	1221 (62.12)	1.52 (1.11–2.07)*
<i>p</i> value		0.013	
Multiple Sexual partners <sup>b</sup>			
No	8374 (73.12)	3987 (48.44)	Ref
Yes	3196 (26.88)	1826 (58.54)	1.75 (1.49–2.05)*
<i>p</i> value		< 0.001	
No condom use in last sex <sup>b</sup>			
No	1541 (29.41)	864 (58.24)	Ref
Yes	3641 (70.59)	2005 (56.75)	1.06 (0.78–1.43)
<i>p</i> value		0.689	

<sup>a</sup>Adjusted for age and sex<sup>b</sup>Among those who had ever sex\**p* value < 0.05

suicidal thoughts, a subgroup with a significantly heightened risk of suicide compared to the general population. Approximately 22% of adolescents experience suicidal thoughts, and alarmingly, about 52% of these adolescents attempt suicide within the last 12 months. Previous research has typically examined the factors associated with suicidal thoughts and attempts separately, potentially overlooking the distinct and amplified risk profile within this specific group. Our findings highlight the critical role of demographic, psychosocial, and behavioral factors in influencing suicide attempts among those with suicidal thoughts. Notably, female adolescents and those experiencing loneliness, anxiety-induced insomnia, and victimization from bullying are at a substantially higher risk. The study also underscores the significant impact of parental connectedness, food insecurity, and substance use on suicide attempts. By focusing on this high-risk group, our research provides valuable insights for targeted interventions and policies aimed at preventing suicide attempts among adolescents with suicidal thoughts in Argentina and beyond, thereby addressing a crucial gap in the existing literature.

The findings from this study reveal several critical factors associated with suicide attempts among school-going Argentinian adolescents with suicidal thoughts. Demographically, female adolescents with suicidal thoughts showed significantly higher odds of suicide attempts compared to males, consistent with previous studies (Mars, Heron et al. 2019). Gender-specific patterns of risk factors have also been

identified, with being offered illegal substances at school and being abused by a boyfriend/girlfriend being significant risk factors for female adolescents (Bae, Ye et al. 2005). The “gender paradox” in youth suicide, where suicide rates are higher in males but suicide attempts are more common in females, underscores the need for inclusive interventions that consider both genetic vulnerabilities and sex/gender differences (Rhodes, Boyle et al. 2014) of adolescents at risk of suicide in Argentina.

While our study found no significant differences across age groups, grades 9th through 12th displayed lower odds of suicide attempts compared to the 8th grade, underscoring a potential transition period’s significance in suicidal behaviors (Wichstrøm 2000, Thompson & Swartout 2018). Factors such as depression, victimization, impulsivity, delinquency, alcohol problems, family and friend suicide history, and experience with partner violence have been identified as significant predictors of suicide attempts during the transition to young adulthood adolescents (Bang & Park 2017, Sharma, Lee et al. 2017, Hinduja & Patchin 2018, Thompson & Swartout 2018, Martínez-Monteaudo et al., 2020). Similarly, our study indicated the pivotal role of psychosocial factors such as feelings of loneliness, anxiety-induced insomnia, traditional and cyberbullying, physical attacks, and physical fights in predicting the likelihood of suicide attempts among suicide ideators. During adolescence, individuals undergo significant social, emotional, and academic changes. Psychosocial stress theory suggests that adolescents with limited coping mechanisms are more vulnerable to suicidal behaviors when faced with these challenges. Consequently, for those who contemplate suicide, attempting it may seem like a compelling way to avoid problems (Liu & Spirito 2019). These findings underscore the need for comprehensive interventions to address the mental health impact of stressful life events during adolescence in Argentina and beyond, particularly among those with suicidal thoughts whose risk of suicide is heightened. Interventions should include accessible mental health resources, educational programs on coping strategies, and robust support networks within schools and communities to provide a safe environment where adolescents can seek help and build resilience (Sharma, Lee et al. 2017, Alvarez-Subiela et al., 2022).

Our study indicated a higher likelihood of suicide attempts among those with truancy and low parental connectedness or awareness. This is in line with findings from previous studies (Kidd, Henrich et al. 2006, Conner, Wyman et al. 2016, Gunn, Goldstein et al. 2018) highlighting the protective role of increased social integration and parental connectedness (Gunn, Goldstein et al. 2018), and emphasizing the direct protective effects of connectedness to parents (Conner, Wyman et al. 2016), particularly among Latina adolescents with strong family ties and supportive parental culture (De Luca, Wyman et al. 2012). In Argentina,

specifically, studies have shown that adolescents perceive parental responsiveness and demandingness as significant factors influencing their behaviors, including substance use and mental health issues, which can be precursors to suicidal tendencies (Peña, Lorenzo-Blanco et al. 2017). These findings underscore the importance of parental connectedness in reducing the risk of suicide attempts among adolescents with suicidal thoughts and should be targeted in future interventions and screening programs. Additionally, truancy can offer valuable insights into the likelihood of suicidal behaviors and may be used in screening programs to identify the at-risk population at schools and reduce the burden of suicide (Welty, Bingham et al. 2024). While a direct association is not explicitly stated, previous literature suggested truancy and school attendance problems may be linked to increased suicide risk in youth through mechanisms like psychosocial stress, interpersonal issues, and poor functioning across domains like education (Jacobs, Baldessarini et al. 2010, Aggarwal, Patton et al. 2017, Welty, Bingham et al. 2024). However, more specific research would be needed to establish and characterize this association in the Argentinian context definitively.

Aligning with our study, food insecurity has been consistently linked to poor adolescent health and mental health, with a graded association between food insecurity severity and mental health problems (Men, Elgar et al. 2021). This relationship is further exacerbated by low parental involvement, low emotional attachment to parents, and poor family functioning (Poole-Di Salvo, Silver et al. 2016, Dush 2020). The inability to consistently provide food creates stress in families, contributing to depression, anxiety, and toxic stress, which makes optimal parenting difficult (Poole-Di Salvo, Silver et al. 2016, Dush 2020). Additionally, food insecurity is directly associated with parental connection, orientation toward success, and uncertainty about the future (Dush 2020). Therefore, school-based screening for food insecurity and housing instability during early adolescence might be crucial in Argentina and beyond, as these experiences increase the risk of long-term adolescent depressive and anxiety symptoms (Hatem, Lee et al. 2020) which mediates the consequent suicidal tendencies.

The observed association between substance use and suicide attempts, particularly with marijuana and amphetamine use, along with alcohol and cigarette consumption, has been supported by various studies. Alcohol and drug abuse, including marijuana and amphetamines, have been identified as significant risk factors for suicidal ideation, attempts, and completed suicide (Wilcox 2004, Pompili, Serafini et al. 2012). A similar study by Ping et al. found a strong association between suicide attempts and alcohol abuse and dependence, followed by frequent cigarette smoking (Wu, Hoven et al. 2004). Additionally, a meta-analysis addressed the association between substance use disorder

(SUD) and suicide outcomes, indicating a significant link between SUD and suicidal ideation, suicide attempts, and suicide death (Poorolajal, Haghtalab et al. 2016). Adolescents with substance abuse disorders who attempt or complete suicide often have comorbid mood disorders, stressful life events, and poor social support (Pompili, Serafini et al. 2012). Emotional distress, including depression and hopelessness, is closely related to suicide risk, with substance abuse playing a role in the suicide process (Overholser, Freiheit et al. 1997). The evidence indicates that a substantial proportion of Argentinian adolescents, ranging from 40–50%, use substances like alcohol, tobacco, and drugs (Biolatto et al., 2023), with alcohol being the most commonly used substance (Pierobon, Barak et al. 2013). This underscores the importance of addressing substance use as a risk factor for suicide attempts among suicide ideators and implementing appropriate interventions. Evidence-based interventions such as cognitive-behavioral therapy, motivational interviewing, and family-based approaches have shown promise in reducing substance use and suicidal behavior among adolescents (Esposito-Smythers, Spirito et al. 2011).

Early initiation of substance use, particularly cigarettes, alcohol, and cannabis, significantly increases the risk of subsequent drug use (Agrawal, Grant et al. 2006). Moreover, early substance use has been linked to numerous adverse outcomes, including academic failure, mental health issues, and criminal behavior, and consequently to higher suicidal behavior (Cho, Hallfors et al. 2007). Preventive interventions targeting young children, particularly those aged 0–8, have been shown to be effective in reducing the risk of substance abuse, delinquency, and violence in adolescence (Webster-Stratton & Taylor 2001). A longitudinal study of Mexican-origin youth identified a range of individual and cultural factors that increase or decrease the risk of early substance use initiation (Atherton, Conger et al. 2016). Community and social factors have been found to be particularly influential in early initiation (Trujillo, Obando et al. 2019). Therefore, collaborative efforts between schools, families, and communities are essential to developing a comprehensive approach to prevention and intervention, ensuring that children receive the support they need to thrive without the influence of substances (Cho, Hallfors et al. 2007). Specifically in Argentina, this includes enforcing more strict regulations and monitoring the implementation to prohibit the sale of substances to minors, providing resources for mental health and substance abuse treatment, and promoting public awareness campaigns that educate about the dangers of early substance use (Pierobon, Barak et al. 2013, Harris 2016).

Risky sexual behaviors, such as early sexual activity and multiple partners, have been linked to increased odds of suicide attempts (Smith, Jackson et al. 2020, Ren et al., 2022, Maurya, Muhammad et al. 2023). Sexual intercourse in

early adolescence may increase the risk for suicidal behavior via mental disorders and distress resulting from being too psychologically immature (Smith, Jackson et al. 2020). The association between risky sexual behaviors and suicidal attempts underscores the need for comprehensive interventions that address the complex interplay of risk factors in this vulnerable population, particularly in Argentina where more than 40% of adolescents aged 13–15 have already started their sexual life, with 24% of them initiated before age 14, and 22% of them having multiple lifetime partners, with higher figures among males (Peltzer & Pengpid 2021). In Argentina, a multi-pronged approach is necessary to combine comprehensive sex education, accessible mental health support, supportive community environments, and targeted interventions for high-risk groups and to better address the complex interplay of factors contributing to risky sexual behaviors and associated negative outcomes among its adolescent population (Smith, Jackson et al. 2020, Pengpid & Peltzer 2022).

Given the findings in this report, policy implications may include enhancing mental health support in schools (e.g., counselors, anti-bullying programs), implementing substance abuse prevention initiatives, and promoting comprehensive sexual education. Additionally, integrating suicide prevention into school health curricula, fostering multi-sectoral collaboration, and maintaining data-driven decision-making are crucial for reducing suicide attempts among adolescents with suicidal thoughts in Argentina.

## Limitations

Although this is the first and most recent study examining the correlates of suicidal attempts among a nationally representative sample of 8–12th grade students with suicidal thoughts in Argentina, we were unable to determine the factors leading to a completed suicide because conclusions are often drawn from suicidal thinking and preparation. Furthermore, the cross-sectional nature of the study only allowed us to identify associations rather than causal relationships; therefore, additional prospective studies investigating factors linked to suicide attempts among suicide ideators are recommended. Underreporting by excluding out-of-school adolescents and lacking relevant demographic data like socioeconomic status, religion, and family dynamics are other limitations. However, we used the data from the Argentina GSHS 2018 which is a national survey with a large sample size and this ensured diversity and representativeness of our findings. Furthermore, the Argentina GSHS 2018 survey did not include potential variables such as family dynamics, social interactions, socioeconomic (e.g., family income, employment status of parents), or school performance which could be relevant to understanding the suicidal behaviors

among adolescents. Future research should consider these variables to provide a more comprehensive analysis. In this study, we used binary variables, which may reduce the granularity of the data. While this approach facilitated analysis and interpretation, continuous variables could offer more detailed insights. Future studies should consider using continuous measures to capture the full variability of these predictors.

## Conclusion

This study provides critical insights into the factors associated with suicide attempts among adolescents with suicidal thoughts, a subgroup with a markedly higher risk of suicide. Approximately 22% of adolescents experience suicidal thoughts, and about 52% of these individuals attempt suicide within the past year. By focusing on this high-risk group, our research highlights the importance of demographic, psychosocial, and behavioral factors. Female adolescents, those experiencing loneliness, anxiety-induced insomnia, and victimization from bullying, are at particularly high risk. Parental connectedness, food insecurity, and substance use also significantly impact suicide attempts. Our findings underscore the need for targeted interventions and policies to prevent suicide attempts among adolescents with suicidal thoughts. Comprehensive interventions should include accessible mental health resources, early screening for substance abuse and food insecurity, and robust support networks within schools and communities. Such measures can create a safe environment for adolescents to seek help and build resilience. Addressing these factors is crucial for reducing the burden of suicide among vulnerable adolescents in Argentina and beyond, filling a vital gap in the existing literature.

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**Data Availability** The Argentina GSHS 2018 is a publicly available dataset and could be downloaded through the WHO official website (URL: <https://extranet.who.int/ncdsmicrodata/index.php/catalog>) upon a reasonable request by a registered user.

## Declarations

**Conflict of interest** The authors declare no competing interests.



**Ethical Approval** This was a secondary analysis of the Argentina Global School-Based Student Health Survey conducted in 2018 (GSHS 2018). The GSHS protocol received approval and guidance from Argentina's Ministry of Education and the Ministry of Public Health. A written informed consent was obtained from the participants or their guardians before the survey.

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