**Suicide attempts among high school students in Argentina, Bolivia and Uruguay. Associated factors from a gender perspective**

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**SHORT ABSTRACT**

Suicide can be understood as the ultimate expression of absence of well-being. It represents a worldwide public health problem, given low priority by governments, with limitations in the implementation of prevention and intervention measures. Using data from the Global School Health Survey (GSHS-WHO), this paper aims to analyze, from a gender perspective, the behavior of high school students aged 13-17 in Argentina (2018), Bolivia (2018), and Uruguay (2019) in relation to suicide attempts and their association with risk and protective factors.

Logistic regression models were applied. Specifically, the interaction term between each factor and gender was analyzed to detect any differences in risk between males and females when exposed to those factors. A general pattern showed higher exposure to suicide attempt risk among females, even when controlling for various factors. Situations such as physical and psychological violence, substance use (tobacco or alcohol), and lower maternal educational levels were associated with a greater increase in the risk of suicide attempts among females compared to males. Conversely, feelings of loneliness or a lack of friends increased the likelihood of suicide among males more than among females. The relevance of this study lies in the finding that the main risk factors identified (feelings of loneliness, worry, lack of emotional support) may have become more prevalent during the pandemic and post-pandemic periods, possibly leading to an increase in suicide attempts. This highlights the urgent need for policies to address the issue.

SUICIDE ATTEMPTS, YOUNG ADULTS, STUDENTS, RISK FACTORS

**LONG ABSTRACT**

**Introduction**

Suicide can be understood as the ultimate expression of absence of well-being. It represents a serious worldwide public health problem with low priority for governments and with limitations in the implementation of actions for prevention and addressing the issue. Thus, the Sustainable Development Goals, in the context of Goal 3, encourage countries, by 2030, to “reduce premature mortality from noncommunicable diseases by one-third through prevention and treatment, and promote mental health and well-being” (target 3.4). Within this framework, it proposes the suicide mortality rate as an indicator. Studying suicide in young populations is crucial for several reasons: 1. It is among the leading causes of death in this age group (WHO, 2018); 2. Suicide rates show an increasing trend (WHO, 2014; Cárdenas, 2021); 3. The aftermath of the COVID-19 pandemic. Studies suggest that children and young people are more vulnerable than adults to the emotional impact of traumatic events that disrupt daily life. Additionally, changes in routines can trigger emotional difficulties, manifesting in altered sleep, eating patterns, and moods (UNICEF, 2020:49).

There is broad consensus among specialists that suicide is a complex, multi-causal phenomenon. Predominant risk factors for suicidal behavior in childhood and adolescence include peer relationships, substance use, poverty/food insecurity, and relationships with parents, among others (WHO, 2014 and 2018).

Gender is known to be directly related to emotional and mental well-being, as well as the prevalence and manifestation of suicide in adolescents. Suicide rates are generally higher among adolescent boys, while girls tend to have higher rates of suicide attempts. Given these differences, the question arises: Are the factors associated with suicide attempts equally relevant for boys and girls?

One of the few sources of data on adolescent suicidal behavior is the Global School Health Survey (GSHS), a WHO project that collects information from adolescent students worldwide. Using data from this survey, the paper aims to analyze, from a gender perspective, the similarities and differences in suicide attempts and associated risk and protective factors among male and female high school students aged 13-17 in Argentina (2018), Bolivia (2018), and Uruguay (2019).

**Data and methods**

This study uses data from the Global School Health Survey (GSHS), conducted periodically in different countries and managed by the World Health Organization (WHO). Logistic regression models were used, with the dependent variable being whether a student had one or more suicide attempts (1 = Had one or more attempts; 0 = No attempts). The coefficients exp(b) were interpreted as odds ratios, indicating how much higher the chances are of experiencing a suicide attempt for a student with a specific characteristic (e.g., being female) compared to one without that characteristic (e.g., being male).

All models include gender (female and male) to demonstrate that the higher likelihood of suicide attempts among females remains, even when controlling for other factors. Risk factors (e.g., violence, feelings of loneliness and worry, poverty/food insecurity, low parental education, substance use, and overweight) and protective factors (e.g., parental support, physical activity) are also included.

Each model incorporates an interaction term between each factor and gender to detect differences in risk between males and females. Values close to 1 indicate no difference, while significant values greater than 1 suggest that the risk increases more for females. Values less than 1 indicate that the risk increases more for males.

**Results**

According to Figure 1, across all three countries, females are more likely than males to report suicide attempts. In Bolivia, nearly 26% of females and 17% of males have experienced at least one suicide attempt. In Argentina, the proportions are slightly lower (19% for females and 12% for males), and in Uruguay, the lowest values are reported (14% for females and 9% for males). In all three countries, the proportion of adolescents with suicide attempts is between 50% and 80% higher for females than for males. The graph also shows that suicide attempts increase in the presence of risk factors for both males and females.

Complementing this, the odds ratios from the logistic models (see Table 1) show the following:

- The chances of experiencing a suicide attempt is 70% higher among females compared to males in Bolivia and Uruguay (odds ratio=1.7), and twice as high in Argentina (odds ratio=2) (model 1 in each table).

- These differences persist across all three countries even after accounting for other factors (Models 2 to 16 in each table), meaning that the higher risk for females is not explained by the prevalence of specific risk factors.

- Complementing Graph 1, all models show how much the risk increases in the presence of a specific factor. A key point is that, in all models, while the factors considered are associated with an increased risk of attempting suicide, they do so differently for males and females. For example, in Argentina, being involved in a fight is associated with a 2.24-fold increase in the likelihood of experiencing a suicide attempt

(model 3). This increase applies to males (the reference category). The interpretation of the interaction term shows that the risk for females is 48% higher (Odds ratio: 1.48). In other words, if involvement in a fight increases the risk for males by 2.24 times, it increases the risk for females by 3.3 times.
In general, factors related to physical violence (e.g., fights, being physically attacked), psychological violence (e.g., bullying, cyberbullying), and substance use (e.g., tobacco or alcohol) are more strongly associated with increased suicide risk among females than males. Conversely, feelings of loneliness or not having friends are more strongly associated with suicide risk among males than females.

Parental education was surveyed only in Argentina, where the mother's educational level was found to be more relevant than the father's. Lower maternal education was associated with a higher suicide risk, particularly for females.

Among protective factors[1], having a good relationship with parents decreases the risk of suicide similarly for both males and females. Physical activity is more beneficial for males, while parental awareness of leisure activities is more protective for females.

The complete document will also examine the prevalence of certain factors and their relationship to increased risk, which are essential to consider when shaping public policy. For instance, in the case of suicide attempts among young people involved in physical fights, although females are more likely to attempt suicide, a higher proportion of males are involved in fights (33% of males, 16% of females). Regarding cyberbullying, both its frequency and its association with suicide attempts are higher among females (see Figure 2).

In summary, the results will show that the factors considered are strongly linked to the risk of attempting suicide, with variations between men and women. Women, in general, tend to be the most vulnerable. This underscores the undeniable need for a gender-focused approach. The importance of this approach is highlighted not only by general statistical trends and the specific data from this study regarding the differences in suicide attempts and completed suicides but also by the influence of heteronormative socialization and traditional masculinity patterns, which are dominant in Western societies and impact the determinants of suicide (Monza and Cracco, 2023). In this context, the sociocultural division of roles and responsibilities based on sex and gender affects the development of both risk and protective factors for men and women, including the different forms of violence that men may perpetrate against women.

Lastly, it is important to emphasize that if the relationships observed between suicide attempts and associated factors in 2018-2019 persist over time, an increase in suicide attempts may be expected in the post-pandemic period, even though data from these countries are not yet available. This projection is supported by the fact that social distancing and isolation due to the COVID-19 pandemic have had significant effects on education, peer relationships, feelings of loneliness, anxiety, and lack of emotional support—all identified as risk factors for suicide attempts.

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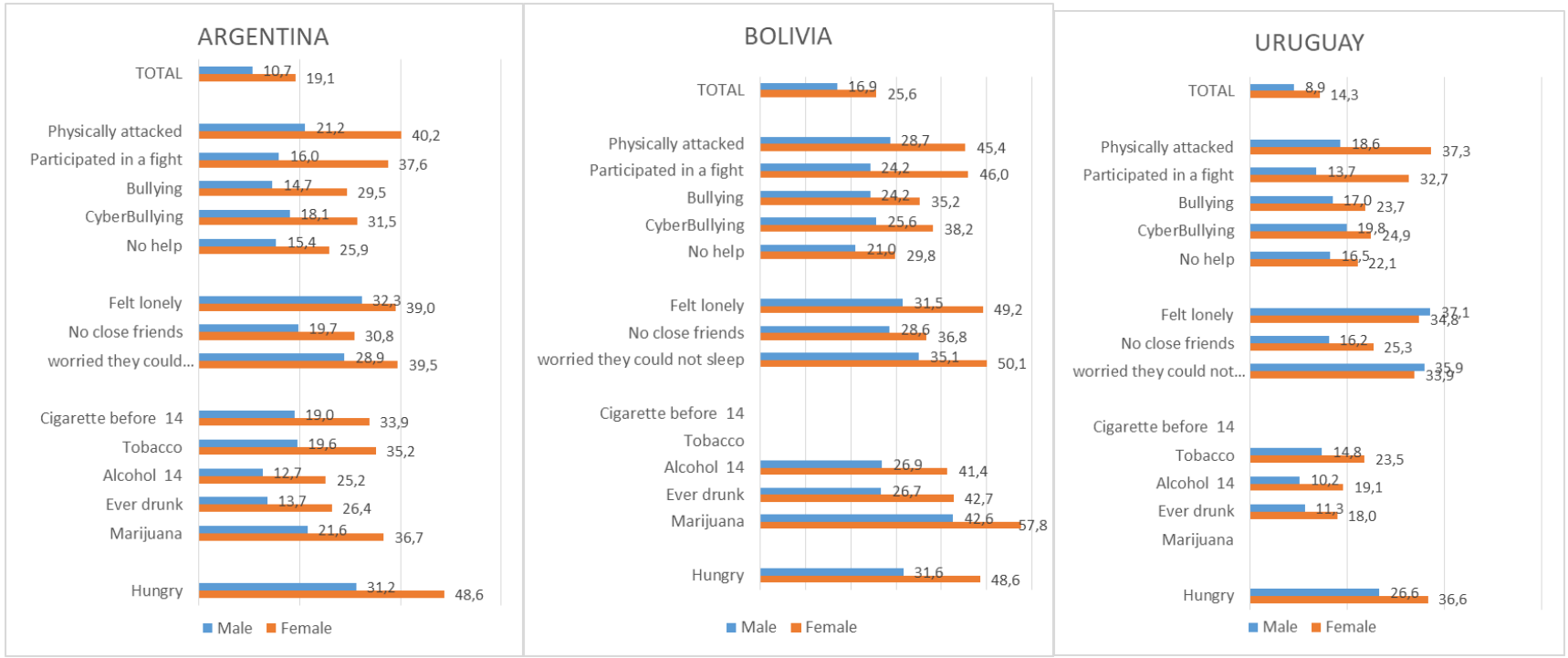
[1] Not included in the abstract yet.

Figure 1. Argentina 2018. Bolivia* 2018 and Uruguay 2019. Prevalence of suicide attempts according to selected factors




*Not all variables are present Bolivia and Uruguay.

Source: GSHS 2018-2019.

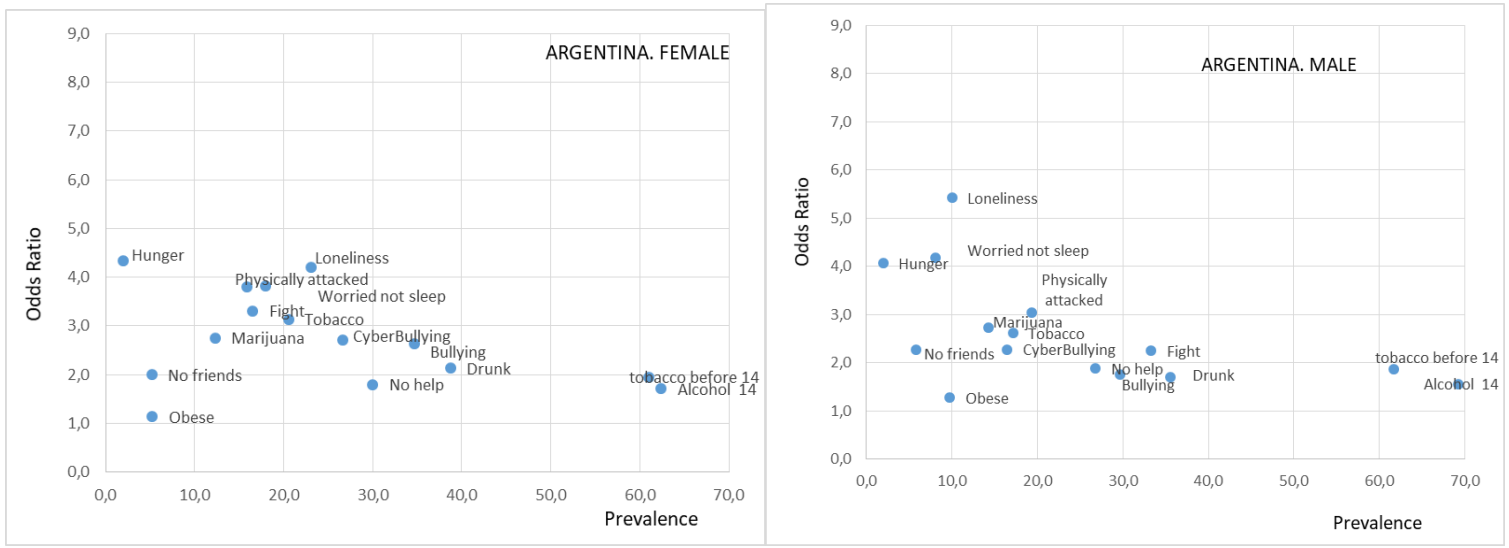
Table 1. ARGENTINA[2]. Prevalence of selected factors and logistic regression models with dependent variable suicide attempts. Coefficients e[b]

| FACTORS | PREVALENCE | | | MODELS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 | M13 | M14 | M15 | M16 |
| Female (*cat ref Male*) | - | 52,5 | - | 1,99 | 2,00 | 2,16 | 1,61 | 1,74 | 2,00 | 2,06 | 1,73 | 1,76 | 2,09 | 1,85 | 2,10 | 1,80 | 2,08 | 2,08 | 2,029 |
| Physically attacked | 19,3 | 15,9 | 17,6 | | 3,04 | | | | | | | | | | | | | | |
| Participated in a fight | 33,3 | 16,5 | 24,6 | | | 2,24 | | | | | | | | | | | | | |
| Victim of Bullying | 29,6 | 34,7 | 32,3 | | | | 1,75 | | | | | | | | | | | | |
| Victim of Cyber bullying | 16,5 | 26,6 | 21,8 | | | | | 2,27 | | | | | | | | | | | |
| No help | 26,8 | 29,9 | 28,5 | | | | | | 1,88 | | | | | | | | | | |
| Do not have very close friends | 5,9 | 5,3 | 5,6 | | | | | | | 2,26 | | | | | | | | | |
| Always or almost always felt lonely | 10,1 | 23,0 | 16,9 | | | | | | | | 5,42 | | | | | | | | |
| Were always or almost always so worried that they could not sleep at night | 8,1 | 18,0 | 13,3 | | | | | | | | | 4,18 | | | | | | | |
| Tried a cigarette before age 14 | 61,7 | 61,0 | 61,4 | | | | | | | | | | 1,87 | | | | | | |
| Smoked cigarettes, at least one day in the past 30 days | 17,2 | 20,5 | 19,0 | | | | | | | | | | | 2,61 | | | | | |
| Drank alcohol before age 14 | 69,2 | 62,4 | 65,7 | | | | | | | | | | | | 1,55 | | | | |
| Ever been drunk in their lifetime | 35,6 | 38,8 | 37,3 | | | | | | | | | | | | | 1,71 | | | |
| Used marijuana (one or more times in their lifetime) | 14,3 | 12,3 | 13,3 | | | | | | | | | | | | | | 2,72 | | |
| Obese | 9,8 | 5,2 | 7,4 | | | | | | | | | | | | | | | 1,28 | |
| Always or almost always hungry (insufficient food at home) | 2,0 | 2,0 | 2,0 | | | | | | | | | | | | | | | | 4,059 |
| INTERACTION FACTOR | | | | | 1,25 | 1,48 | 1,51 | 1,20 | 0,96 | 0,88 | 0,78 | 0,91 | 1,04 | 1,20 | 1,10 | 1,25 | 1,01 | 0,89 | 1,07 |
| | | | | p= | 0,00 | 0,00 | 0,00 | 0,00 | 0,40 | 0,00 | 0,00 | 0,15 | 0,60 | 0,00 | 0,12 | 0,00 | 0,86 | 0,31 | 0,84 |

Source: GSHS 2018-2019.

[2] Bolivia and Uruguay not included in the abstract yet.

Figure 1. Argentina 2018. Suicide attempts. Relationship between prevalence and odds ratios




Source: GSHS 2018-2019.