Risk and protective factors for suicidal ideation and attempt in Latin American adolescents and youth: systematic review.

Factores de riesgo y protección para la ideación e intento de suicidio en adolescentes y jóvenes latinoamericanos: revisión sistemática.

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Abstract

Suicidal behavior is constituted as a public health problem, and the literature is recognized extensively for enunciating risk and protection factors associated with the attempt of suicide. The evaluation of the methodological quality of the primary studies is required by systematic reviews, thus guiding decision-making regarding the design of interventions from the risk approach. The identification of the risk and protective factors associated with suicidal ideation and attempts in adolescents and young people in Latin America studies and the evaluation of the methodological quality of the included studies were the objectives of this systematic review. The databases CUIDEN, LILACS, Pubmed, Scielo, Science Direct, SCOPUS, EBSCO, and Medline were consulted, with the results being restricted to articles in the last 10 years. A total of 3,642 documents were obtained, from which 19 studies were included. Of the studies, 52.63% (n=10) were

found to have a medium internal validity level, and 57.89% (n=11) were determined to have a medium global quality level. The most frequently reported family risk factors were family dysfunction and suicide background, with other factors including the presence of mental disorder, psychoactive substances consumption, physical violence, sexual violence, and the social factor. On the other hand, the study of protective factors was found to be limited, with family functionality and support being the most frequently reported evidence.

Keywords: Suicide; teenagers; youths; risk factors, review, DeCS source.

Resumen

La conducta suicida se constituye en un problema de salud pública, la literatura es amplia en enunciar factores de riesgo y protección asociados al intento de suicidio. Se requiere revisiones sistemáticas que evalúen la calidad metodológica de los estudios primarios y así orientar la toma de decisiones frente al diseño de intervenciones desde el enfoque de riesgo. El objetivo de esta revisión sistemática fue identificar los factores de riesgo y de protección asociados a la ideación e intento de suicidio en adolescentes y jóvenes en estudios de Latinoamérica y evaluar la calidad metodológica. Se consultó las bases de datos CUIDEN, LILACS, Pubmed, Scielo, Science Direct, SCOPUS, EBSCO y Medline, restringiendo los resultados a artículos en los últimos 10 años. Se obtuvieron 3.642 documentos de los cuales se incluyeron 19 estudios. El 52,63% (n=10) de los estudios obtuvo un nivel medio en validez interna y 57,89% (n=11) nivel medio de calidad global. La disfuncionalidad familiar severa y el maltrato familiar fueron los factores de riesgo familiares más reportados, el antecedente de suicidio el factor biológico, la presencia de depresión y el consumo de sustancias psicoactivas fueron los factores psicológicos; el abuso sexual y el acoso escolar los factores sociales. Por su parte, el estudio de los factores protectores fue escaso, el más reportado en la evidencia fue la funcionalidad y el soporte familiar.

Palabras clave: Suicidio; adolescentes; jóvenes; factores de riesgo, intento de suicidio, revisión fuente DeCS.

Introduction

Adolescence is considered a crucial stage of human development, during which individuals are subjected to significant physical, psychological, and social changes. This period presents numerous opportunities for personality development that will establish the groundwork for adult behavior. However, it is also a time when individuals may

encounter considerable conflicts and risks to their mental health. (Caceda, 2014; Arias, 2021). One of the risks is suicidal behavior, which is a consequence of the interaction of multiple causes and predisposing factors with a high potential for prevention. (Carballo, 2008; Clayton, 2018).

According to Andrade (2012), the ideation and suicide attempt in adolescence are, in most cases, seen as the expression of a desire to change an existing social and psychological chaos. It is regarded as a form of reaction to the feeling of impotence to change a situation that has become unbearable. While suicidal behavior is understood as a process that is gradually occurring and is manifested in various ways, including the desire or manifestation of dying, the image of death, and the suicidal attempt, up to completed suicide.

In Latin America, high incidences of suicidal behavior in adolescents and young populations have been reported in several recent studies. For example, two ecological studies were conducted by Dávila and Luna in Mexico in two different years; the first in 2018 using data from the National Health and Nutrition Survey (Ensanut), where 21,509 adolescents were included, and the second in 2019 using data from the national drug use survey where 26,503 Mexican students were included. In the first study, the incidence of attempted suicide was found to be 2.74%, with 1.45% occurring in the twelve months prior to the survey and 1.29% taking place before the period of study (Davila y Luna, 2018). It was reported that men had 4.3% ideation, 3.6% planning, and 3.3% intent, while women had 7.9% ideation, 8% planning, and 10.3% attempted suicide. In

Colombia, according to the latest figures from the National Institute of Health, attempted suicide is increasing, with a rate that went from 52.41 in 2017 to 62.17 per 100,000 inhabitants in 2019 (Dávila, 2019).

Given that suicide attempts and suicide mortality are considered a Public Health problem, it is contended by this research that suicidal behavior is etiologically determined by a cluster of biological, psychological, social, and environmental conditions that are manifested at the individual level as risk factors. Therefore, it is deemed pertinent to be aware of the associated factors of suicide ideation and attempts that are considered as a foundation for the implementation of interventions from the perspective of modern pidemiology founded on scientific evidence. (Alvarez, 2008). The reviews conducted on the subject were found to be non-systematic (Serrano, 2017; Azua, 2020; Londoño, 2020 and Arias, 2021), lacking in thorough research in databases (2-5), not in accordance with the PRISMA statement guidelines, and with no assessment of the studies' methodological quality. The aforementioned characteristics are met by only one review (Hernandez, 2020); however, it is focused solely on the adolescent population and lacks specificity to Latin America. Therefore, the objective of this systematic review was to identify the risk and protective factors associated with ideation and suicide attempts in adolescents and young people in Latin American studies, and as a secondary objective, to evaluate the methodological quality of the included studies.

Method

A systematic review of the literature, in accordance with the PRISMA guidelines declaration (Urrutia, 2010) was conducted in November 2021 and updated in December 2023 on risk and protective factors for suicidal ideation and attempt in adolescents and young people. The databases CUIDEN, LILACS, Pubmed, Scielo, Science Direct, SCOPUS, EBSCO, and Medline were consulted, with the results being restricted to articles in the last 12 years in order to obtain the most recent data. The following keywords consulted in the Health Sciences Descriptors library were used to design search equations combined with the Boolean operator AND and OR as follows: suicide AND adolescents OR young people and suicide AND risk factors for the Spanish language and its counterparts in the English and Portuguese languages. The search was conducted by two authors (del Pino, 2014).

Inclusion and exclusion criteria

Analytical quantitative studies on risk and protection factors with Latin American samples in adolescents and young people are examined in this review. Adolescents are defined as those subjects aged between 10-19 years, while young people are defined as subjects between 15-24 years old, according to the World Health Organization's definition. The publication format of these studies was an original scientific article within the last 10 years, originating from Latin American countries. Studies with ecological designs, lacking statistical information on association (such as chi square tests, p values, odds ratio), and falling within the realm of gray literature were excluded:

Serapio Costa, A. Realidad psicosocial: La adolescencia actual y su temprano comienzo. Universidad Complutense de Madrid

Organización Mundial de la Salud. (2023). Salud del adolescente.

Selection of studies

The initial selection of studies was conducted by reading the titles, and the chosen ones were downloaded into the Mendeley bibliographic manager. Subsequently, the articles saved in Mendeley were reviewed to eliminate duplicates. Following this, the summaries of the remaining articles were read in order to apply the first filter. The first filter results were examined by applying a first reading of the full text to ensure that the studies met the inclusion and exclusion criteria. Subsequently, the studies that met the inclusion and exclusion criteria were exported to an Excel spreadsheet.

Risk of bias assessment of studies

The Ciapponi critical reading guide was used, which allows to evaluate bias in observational studies through internal validity. For the purposes of this review, items 2, 3, 4, 5, 6, 15, 16, 17 and 18 of the guides were taken considered (Ciapponi, 2014).

In order to reduce publication and selection bias in this review, the search and selection of studies were contrasted and audited by the third author, while being conducted by two authors. Search equations were utilized in three different languages and multiple bibliographic sources were consulted to ensure a comprehensive search.

Additionally, a bibliographic manager was employed to facilitate an appropriate selection and the correct application of filters.

Variables and data collection

Three types of variables were categorized from the review protocol: sample characteristics, suicidal behavior variables, and risk and protective factors. Based on this categorization, the variables were organized into an Excel matrix during the data extraction process:

Sample characteristics: year of publication; country, scientific article; study design, quantitative, population.

Variables on suicidal behavior: suicidal ideation and attempt.

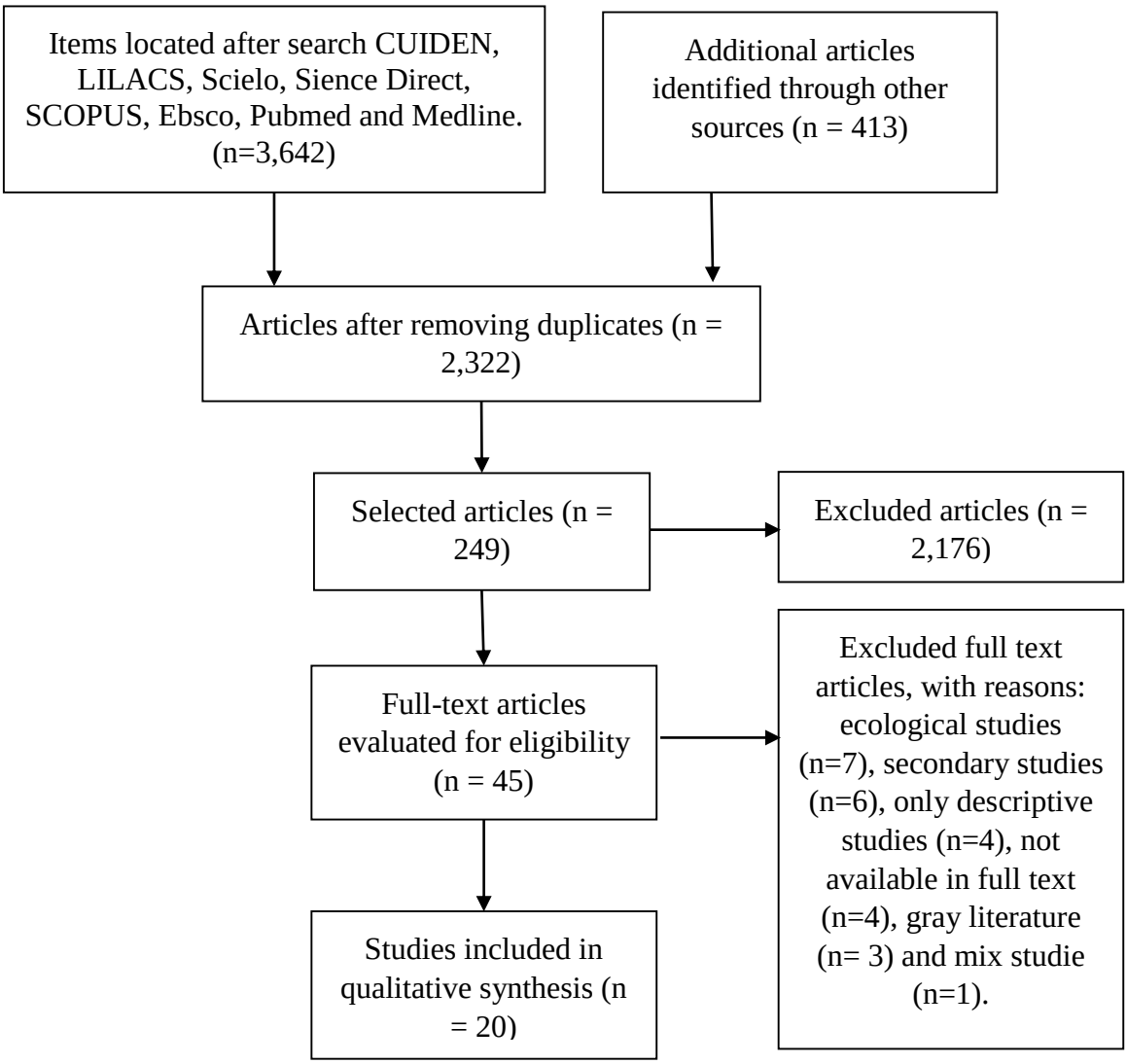
Risk and protective factors: sociodemographic (gender, low socioeconomic level, low educational level), biological (decreased neurotransmitters, heredity), psychological (alterations in mood, psychosis, self-esteem) social (family dysfunction, lack of social support, alcoholism, smoking and psychoactive substances use, bullying, relationships) cultural (ethnic minorities) and spiritual practices (religion, beliefs).

Data analysis

Data synthesis was conducted by extracting statistical estimates according to the type of variable previously categorized, through a summary of the findings of the articles included in the review. The minimum and maximum percentages indicating the

prevalence of suicide ideation and attempts were identified, along with the statistical estimators of association for risk and protective factors. Furthermore, the vote counting technique and the Sign Test have been utilized. The vote count enables a comparison between the number of studies reporting a positive association and those reporting a negative association. In this instance, studies demonstrating a statistically significant association between a given factor and suicide ideation and/or attempt were assigned a positive vote, while a negative vote was given to studies lacking such an association. The sign test was utilized to determine if the difference in the number of positive studies was significantly greater than the opposite result. A significance value of less than 0.05 was established, although these analysis techniques are limited, they help to guide the results of the review (del Pino, 2014). This information was organized and compiled in a table.

Figure 1. Study general outline (PRISMA)



Results

Characteristics of the sample

A total of 4,055 documents were obtained, of which 20 studies conducted in Latin America were included. 50% (n=10) were conducted in Colombia, 15% (n=3) in

Mexico, 10% (n=2) in Cuba, 15% (n=3) in Chile, Jamaica and Peru 5% (n=1) each (figure 1).

A cross-sectional analytical design was utilized in 95% (n=19) of the studies, while 5% (n=1) were characterized by a retrospective longitudinal design. Of the total, 35% (n=7) employed probabilistic sampling methods, with 4 utilizing a stratified type and 3 using a simple random type. The remaining 65% (n=13) of studies employed non-probabilistic sampling methods, such as convenience, incidental, or snowball sampling. With respect to the sample of participants, 70% (n=14) of the studies were conducted in adolescents attending secondary school, of which 28.57% (n=4) examined the age range between 15-20 years, while 71.43% (n=10) included adolescents aged 10-15 years. Additionally, 20% (n=4) of the studies incorporated adolescents from mental health institutions, with only 1 studying adolescents between 10-21 years old. 5% of the sample included university students from the Medicine program aged 16-36 years and adolescents from the LGTBIQ+ community, respectively. The smallest sample, consisting of 46 adolescents, and the largest sample, consisting of 2,997 individuals, were included in the study.

Risk of study bias.

The evaluation of the biases of the included studies was conducted using the Ciapponi critical reading guide, which assesses the internal validity and overall quality of the investigations with observational designs. A medium internal validity level was obtained by 55% (n=11) of the studies, while a high level was obtained by 30% (n=6) and a low level by 15% (n=3). In terms of global quality, a medium level was obtained by 60% (n=12), a high level by 30% (n=6), and a low level by 10% (n=2) (appendage 1).

Prevalence of suicidal ideation and attempt.

Suicide ideation and attempt were measured with different self-response instruments in 80% (n=16) of the cases. Among these, in 20% (n=4) of the studies, the authors' own questionnaire was designed, while 15% (n=3) utilized the Plutchik scale, and 10% (n=2) employed the Positive and Negative Suicidal Ideation (PANSI) and Okasha, respectively. Various instruments such as student health survey, youth health survey, suicidal ideation scale, Beck scale, CES-D scale, and Columbia University rating scale were used in the rest of the investigations (n=6). On the other hand, suicidal ideation and/or attempt were not measured in 3 studies because the participants were adolescents with suicide attempts who were in mental health institutions.

The range of prevalence of suicidal ideation in school adolescents was found to be between 22.8% and 31.4% according to the Plutchik scale, while it was reported to be between 8.1% and 9.7% with the questionnaires designed by the authors. Suicidal ideation was measured at 19.5% using the suicidal ideation scale, 14.9% with the Beck

scale, 43% with PANSI, 14.7% with the CES-D Scale, 23.6% with the student health survey, and 14.23% with the survey of youth health.

In relation to attempted suicide, the prevalence was found to be 12.2% according to the Plutchik scale, 17.5% according to the student health survey, 3.55% according to the youth health survey, between 9% and 16.4% according to Okasha, and between 4.9% and 22.4% with the questionnaires designed by the authors. Additionally, it was determined to be 2.7% according to Beck and 13.9% according to the CES-D Scale.

Instruments used for associated factor measurement

The review included studies that utilized a variety of instruments to measure the wide range of factors associated with suicide ideation and attempts, with a total of 34 instruments being identified. Of these, 8.8% (n=3) were constructed by the researchers themselves to measure variables such as cigarette consumption, psychoactive substance consumption, bullying, sexual abuse, and family structure (Mendez 2022, Alvarez 2015, Pineda 2019). Meanwhile, 88.2% (n=30) were comprised of validated instruments, and only two investigations utilized the structured interview to investigate variables such as history of suicidal behavior, family mental disorders, among others (Perez 2020, WD 2012).

The family APGAR, used to measure family dysfunction, was found to be the most utilized among the validated instruments (Alvarez 2013, Cañon 2018, Aguirre 2013, Perez 2012, Valdivia 2015) and the Rosemberg Self-Esteem Scale (Silva 2017,

Cañon 2018, Aguirre 2013, Perez 2012, Sarmiento 2011), Both were used in 5 investigations. This was followed by the CAGE Scale for alcohol dependence in 4 studies (Alvarez 2012, Cañon 2018, Pinzon 2013, Aguirre 2013). Thirdly, the Beck Hopelessness Scale (Silva 2017, Garza 2019, Valdivia 2015) and the Cisneros Scale for bullying (Cañon 2023, Cañon 2018, Aguirre 2013) were located in three investigations each.

Several instruments were used in relation to the depression variable, including the CES-D depression scale (Pinzon 2013, Secundino 2020, Sarmiento 2011), the Beck Depression Inventory (Silva 2017, Valdivia 2015), the Birleson Scale (Alvarez 2014, Aguirre 2013), and the Columbia Depression Scale (Perez 2012). Furthermore, instruments that measure, in addition to depression, anxiety, and stress variables such as the Goldberg Depression and Anxiety Scale (Cañon 2022), the Hospital Depression and Anxiety Scale (Cañon 2018), and the DASS-21 (Mendez 2022), are utilized.

Risk factors associated with suicidal ideation and attempt

All of the investigations (n=19) that were studied and related to risk factors for suicidal ideation and attempt in adolescents were described below:

Family risk factors: Dysfunctionality (OR 2.17 P 0.046), negative parenting style (OR 2.42 CI 1.71–3.42), parental absence (OR 2.31 p0.019), Negative affect (0.587 p=0.000) poor communication with parents (OR=10.51 p=0.0000), lack of parental protection (OR2.9 CI95%1.3-6.4), conflictive communication (OR=8.500, CI=3.013-

23.978, p= 0.000), history of suicidal behavior (OR = 5.62 p=0.0091), psychiatry treatments hospitalization background (60% p = 0.005), domestic violence P(0.000), negative paternal role (OR 3.1 p0.01) (Aguirre 2013, Álvarez 2012, Bimala 2015, Perez 2012, Silva 2017, Valdivia 2015, Cañón 2018, Sarmiento 2011, Álvarez 2017, Cañón 2017, Canyon 2021, Suarez 2018, Pérez 2020).

Biological risk factors: history of suicide (OR =5.62 p=0.0091), suicide attempts and ideas background (OR = 3.26 p=0.0126), age (β = 9.63; CI= 2.31- 16.96; p≤ 0.005), female gender (OR, 5.12; CI: 3.32–7.89) (Álvarez 2012, Bimala 2015, Pérez 2012, Silva 2017, Valdivia 2015, WD 2012, Cañón 2017, Pineda 2019, Secundino 2020, Perez 2020, Mendez 2022).

Psychological risk factors: mental and eating disorders (OR= 8.40 CI= [1.64-42.79] p=0.0098), depression (OR=3.34 p=0.0095), anxiety (OR= 6.13 p =0.0010), stressful situations (386.53 t -7.338 p<(0.001), stressful events 386.53 t -7.338 p<(0.001), low self-esteem (OR 2.61p0.024), hopelessness (OR=2.66; p=0.0019), consumption of psychoactive substances (OR 2.40 CI 1.42–4.04), smoking (OR 2.6 p0.001), alcoholism (OR= 7.60 CI= [1.91-30.17] p=0.0035), marihuana use 21.9% (lC95%:13.1%-33.1%) (Aguirre 2013, Álvarez 2012, Bimala 2015, Pérez 2012, Silva 2017, Valdivia 2015,2012 WD, 2018 Canyon, 2011 Sarmiento, 2017 Alvarez, 2017 Canyon, 2021 Canyon, 2020 Secundino, 2019 Garza, 2013 Pinzón).

Social risk factors: bullying victim (OR = 24.54 p=0.0000), love breakups (OR=25.375, CI=5.258-123.391, p=0.000), partner infidelity (p=0.000), love

disappointments 48.7% p (0.001), violent context (OR 2.09; CI: 1.41–3.10), few educational opportunities (OR 2.71 p<(0.05), sexual violence (OR=3.28; 95% CI 1.75, 6.13), domestic violence (OR= 2.330 CI95%=1.284-4.228) emotional (OR, 2.31; CI, 1.60-3.34), self-harm (p=0.000, PR=47.25), sexual orientation (OR=20.11 p=0.0000), perception of regular or poor academic performance during the last year (OR: 2.2; 95% CI: 1.38-3.63) (Aguirre 2013, Pérez 2012, WD 2012, Canyon 2018, Canyon 2021, Pineda 2019, Secundino 2020, Suarez 2018, Pérez 2017, Pérez 2020, Garza 2019, Pinzón 2013, Mendez 2022).

Spiritual risk factors: Not practicing any religion (OR 1.2 p0.019) (Silva 2017) and professing Catholicism (χ 2=8.032; p = 0.018; V=0.14) (appendage 2).

Among the risk factors reported by the studies included in the present review, it is notable that factors such as cigarette consumption, psychoactive substance consumption, severe family dysfunction, dependence on alcohol consumption, low self-esteem, sexual abuse, bullying, depression, psychological abuse, female sex, being insulted, academic performance, having divorced parents, love disappointments, recent and past suicidal ideation, anxiety, family abuse, and family history of suicide attempts are included.

However, the vote counting technique and sign test analysis, which were performed to estimate the significance of the difference in the number of studies reporting a positive association compared to those reporting opposite results, revealed

that only the difference for the low self-esteem variable was found to be significant (appendage 3).

Protective factors for suicidal ideation and attempt

Only 26.31% (n=5) of the investigations studied and/or related protective factors for suicidal ideation and attempt, which are described below:

Family protective factors: family functionality (OR 0.62 CI 0.43-0.90), support from families and friends (OR= 0.3697) (WD 2012, Cañón 2018, Suarez 2018).

Psychological protective factors: high self-esteem (OR 0.51 CI 0.18–1.41) (WD 2012, Canyon 2018).

Social protective factors: social support (OR=0.37 p=0.000), living in a rural area (OR 0.62 (0.41-0.86) (WD 2012).

Spiritual protective factors: religious affiliation (PR=0.946) (Pineda 2019, Cañón 2021)

Discussion

In Latin America, research on factors associated with suicidal ideation and attempt is found to be more focused on the study and correlation of risk factors, as evidenced by the results of this review. Conversely, the investigation of protective factors is typically more restricted and less prevalent. Results that are in agreement with the

review conducted by Hernandez (2020) were reported, indicating that only 5 out of 23 analyzed investigations had examined protective factors. The study of risk factors is focused on by several objectives such as predicting a phenomenon, determining the causes, making a diagnosis, or eliminating the risks in order to prevent the occurrence of a problem. However, the possibility of promoting positive strategies that reduce the probability of falling into certain risks is left aside by this position, so it is important for the phenomena to be studied also from this positive sense (Amar, 2003; Giner, 2010; Perez, 2020; Servicio de Andaluz, 2010).

The most common risk factors reported in the studies are of a familial nature, such as family dysfunction, poor communication with parents, domestic violence, and negative parenting role or style. Unlike the biological and spiritual factors, which were studied to a lesser extent. Similar findings were reported in the review by Arias, Morantes, Montoya (2021), where family factors such as dysfunction and violence were found to be the most frequently reported in the studies analyzed. The important role that the family plays in the development of a healthy environment that prevents the development of suicidal thoughts and attempts is shown by these findings (Brent, 2005).

The poorly structured nature of the family and the development of a conflictive and violent atmosphere expose its members to be considered wrong solutions that lead to self-destructive behavior. The means of communication of feelings, demands, or pleas, which are not known or cannot be expressed by the adolescent in any other way, are become by the lack of adequate coping strategies, as well as the necessary family

cohesion that allows fears to be expressed, tensions and anxieties to be resolved, problems to be solved, and clear guidelines to be established based on love, trust, respect, and understanding. According to Garza (2019), confusing norms and rules were received by more than half of the adolescents and young people interviewed in their study, along with few limits and excessive punishments; Furthermore, it was indicated by 20% that they do not have anyone in their family to rely on in case of problems. t is believed that the adaptive behaviors of childhood, which will be solidified in adolescence and youth, are impacted by parenting. A significant role is played by these behaviors in the quality of the parent-child relationship, as well as in the perceived family and social support by the young person when they are confronted with life stresses and mental health issues.

In second place, psychological factors such as hopelessness, mental disorders, and the use of psychoactive substances are considered. Thirdly, social factors such as sexual and domestic violence, bullying, love breakups, and lack of social support are also taken into account. Various reviews (Serrano, 2017; Azua, 2020; Londoño, 2020; and Arias, Morantes, Montoya, 2021) have indicated that mental disorders, particularly depression and substance use, are directly associated with a higher risk of suicidal ideation and attempt. Similarly, the risk is greatly increased by being in a violent and hostile environment and having little or no social support.

Bullying in all its forms, including cyberbullying, has been observed to have gained strength in recent years as a social factor, resulting in significant emotional distress among adolescents and prompting suicide attempts. However, the risk factor in

question may be surrounded by contradictory scientific evidence. It was observed by Lardier (2016) that in adolescents, the probability of suicidal ideation was increased by bullying; however, after conducting multivariate logistic regression analysis, the effect was found to no longer be significant. This was achieved by including other risk variables such as depression, family conflict, and substance use. It has been reported by other investigations that a statistically significant relationship exists(Aguirre, 2013; Pérez, 2012; Cañon, 2018; Cañon, 2021).

In relation to the protective factors, the most reported ones were relatives such as family functionality and family support. Results align with the review conducted by Arias, Morantes, and Montoya (2021), who also identified these factors as the most extensively studied in a positive light and linked to the lack of suicidal ideation and attempts. The family is seen as a system of relationships, where each member contributes from their own individual characteristics to the creation of a secure environment. In cases where the adolescent is situated within a family unit that effectively regulates these connections and establishes explicit boundaries and guidelines, functional interaction at an emotional and social level can be achieved, aiding in the management of emotions during crises and facilitating positive engagement with life's transitions. This, in turn, diminishes the likelihood of the manifestation of suicidal behavior (Cid, 2014; Sánchez, 2015).

The prevalence of suicidal ideation was found to be variable as a result of the heterogeneity in which it was measured in studies, with figures ranging from 8.1% as the

lowest to 43% as the highest in adolescents and young people in school. Similarly, attempted suicide also exhibited a variable prevalence, with the lowest figure being 2.7% and the highest being 17.5%Despite these differences, it is shown by these figures that both suicidal ideation and suicide attempts are a public health issue that occurs frequently in the young population, and the urgent implementation of strategies and programs for prevention is required. Through an articulated, comprehensive, and community approach, steps prior to suicide are taken, greatly increasing the probability that a subject will die from this cause (National Institute Of Mental Health, 2020; Ministerio de salud, 2018). According to Echeburúa (2015), if a subject has had a suicide attempt, the risk of committing suicide increases in the weeks after the act, making it important to provide the necessary therapeutic help and activate the family and social support network.

Furthermore, a high social value is placed on the young population by societies due to their highly productive stage. Consequently, the occurrence of suicidal behavior in young individuals results in significant direct and indirect costs, including the loss of potential years of life in those who commit suicide and the high health costs associated with hospitalization and treatment for those who attempt suicide (United Nations Children's Fund, 2021); According to PAHO in the Americas, suicide is considered the fifth cause of this indicator, as well as years of life adjusted for disability (Pan American Health Organization, 2019).

In this sense, a synthesis of the risk factors associated with suicide ideation and attempts is provided by this review, which must be taken into consideration when developing programs for the prevention of suicidal behavior and the promotion of mental health from an interdisciplinary approach in health, as the reduction of these risk factors must be achieved through interventions in order to protect adolescents and young people. However, it is deemed necessary for future research to be bolstered in the examination of protective factors, as it is recommended that positive factors be identified that can serve as a foundation for the promotion of mental health in a constructive manner that not only enables young individuals to utilize and amplify their own resources, but also fortify their familial, educational, and societal surroundings.

It should be noted that most of the studies selected their participants using non-probabilistic sampling, often for convenience. This type of sampling is typically utilized by researchers when there is a restricted timeframe for conducting the investigation or when there are financial constraints hindering the execution. However, this type of sampling is accompanied by certain limitations that result in a low external validity of the findings and introduce weaknesses to the associations, as total representation of the population is not guaranteed and objectivity may be lacking (Hernandez, 2014). In turn, the internal validity of 68.41% (n=13) of the studies included in the review, which were classified as having medium and low validity, was affected by this type of sampling. Therefore, it is deemed important that for future studies from the risk approach, primary research be conducted to reduce the barriers for the execution of probabilistic sampling,

ensuring greater objectivity and representativeness of the population (Araujo, 2011; Otzen & Manterola, 2017).

Similarly, the results of this review indicate that there are few observational studies in the scientific evidence that can be classified as having high internal and global validity according to the criteria of the Ciapponi guide through critical reading, due to the characteristics of the methodological designs. Observational research of higher quality was conducted by researchers, who were evaluated, in order to achieve greater control over biases that may be encountered, and which are unrelated to the limitations of various existing observational designs. (Ciapponi, 2014). Despite the contributions of this review, some limitations can be considered, such as the heterogeneity of the results that prevent quantitative analysis of the data (meta-analysis). Although an extensive search was conducted, it is possible that scientific evidence of interest that could contribute to the results of this review has eluded detection.

In conclusion, the high prevalence of suicidal ideation and attempts in the young population of Latin America is frequently associated with risk factors such as cigarette consumption, psychoactive substance use, severe family dysfunction, alcohol dependence, low self-esteem, sexual abuse, bullying, depression, psychological abuse, female gender, verbal insults, academic performance, parental divorce, romantic disappointments, recent or past suicidal ideation, , anxiety, family abuse, family history of suicide attempt and/or suicide, parental absence and hopelessness.

The evidence concerning protective factors is limited, and the ones that have been most extensively examined are family functionality and family support. The majority of the scientific evidence published on the topic can be categorized as having a medium level of methodological quality.**References**

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Appendage 1.

Studies bias bisk according to Ciapponi.

Main author, year and country	Internal validity										Overall qualityb
	Summary assessment	Items									
		two	3	4	5	6	fifteen	16	17	18	
Aguirre et al, 2013, Colombia	Average	G.	G.	G.	R	R	G.	G.	G.	R	Average
Alvarez, 2012, Colombia	High	VG	VG	VG	G.	G.	VG	VG	G.	G.	High
Bimala, 2015, Peru	High	VG	VG	VG	G.	G.	VG	G.	G.	G.	High
Perez, 2012, Colombia	High	VG	VG	G.	G.	G.	VG	VG	VG	G.	High
Silva, 2017, Chile	Average	G.	G.	G.	G.	R	G.	G.	G.	R	Average
Valdivia, 2015 Chile	High	VG	VG	VG	G.	G.	VG	VG	G.	G.	High

W.D., 2012, Jamaica	Average	G.	G.	G.	R	NI	G.	G.	R	NI	Average
Canyon, 2018, Colombia	High	VG	VG	VG	G.	G.	G.	VG	G.	G.	High
Sarmiento, 2011, Mexico	Average	G.	G.	G.	R	G.	G.	R	G.	G.	Average
Alvarez et al, 2017, Cuba	Low	NI	NI	NI	R	NI	NI	NI	NI	NI	Low
Canyon Et al 2017, Colombia	High	VG	VG	VG	G.	G.	VG	G.	NI	R	High
Canyon et al, 2021, Colombia	Low	G.	G.	R	B	R	VG	VG	DA	G.	Average
Pineda et al, 2019 Colombia	Average	R	G.	R	DA	R	VG	VG	VG	VG	Average

Secundino et al, 2020, Mexico	Average	NI	R	G.	G.	NI	VG	VG	DA	G.	Average
Suarez et al, 2018 Colombia	Average	NI	R	G.	B	DA	G.	G.	DA	G.	Average
Martinez et al, 2017, Colombia	Average	G.	G.	G.	G.	G.	R	B	G.	R	Average
Perez et al, 2020, Cuba	Low	G.	G.	G.	DA	R	NI	NI	NI	NI	Low
Garza et al, 2019, Mexico	Average	R	R	G.	DA	G.	G.	G.	DA	R	Average
Pinzon et al, 2013, Colombia	Average	R	G.	G.	R	R	VG	VG	VG	G.	Average
Mendez et al, 2022, Chile.	Average	R	G.	G.	R	R	VG	VG	VG	G.	Average

Note. a. Internal validity: defines whether the study design minimizes bias and confounding. Items: 2. The exclusion criteria for participants are indicated, as well as the sources and selection methods; 3. The selection criteria are adequate to answer the question or the study objective; 4. The study population, defined by the selection criteria, contains an adequate spectrum of the population of interest. 5. An estimate of the sample size, confidence level, or statistical power was made for the estimation of the measures of frequency or association that the study sought to obtain. 6. The number of potentially eligible people is reported, those initially selected, those who accept and those who finally participate or respond; 15. Statistical analysis was determined from the beginning of the study; 16. The statistical tests used are specified and are adequate; 17. Participants loss, missing data, or other were handled correctly. 18. Major potential confounders were consedered in the design and analysis. Evaluation: VG: very good, G: good, R: regular, B: bad, NI: no information, DA: doesn´t aply.**b. Overall quality of the studies:** HIGH: most of the statements are answered as "very well" or "well"; AVERAGE: the internal validity is qualified as «AVERAGE» or most of the statements are answered as «good» or «regular».

Appendage 2.

Synthesis of the studies included in the review.

Author, year, country, type of study.	**Sample and features**	**Prevalence of suicidal behavior**	**Associated factors**
Aguirre et al 2013 Colombia.	322 high school students.	16.5% of the adolescents presented suicide	**Risk factors:** 41.9% (PR 4.98 CI 2.47-10.5 p 0.000) cigarette consumption. 27% (PR 2.79 CI: 1.53-5.1 p 0.01) use of psychoactive substances. 48.8 (PR: 15.83 p 0.00) Severe family dysfunction. 36.8 PR 2

Transverse Analytical	Probability sampling stratified by gender and age	risk according to the Plutchik scale.	p(0.01) dependence on alcohol consumption. 42.9 (PR 7.5 p 0.00) low self-esteem. 37.3% PR 5.3 CI: 2.83-9.89 p(0.00) eating behavior disorders. 30.1% PR: 13.89 p(0.00) high bullying. 50% depression.
Alvarez et al 2012 Colombia. Cross	354 high school students. Non-probabilistic sampling.	12.2% of the adolescents had attempted suicide and 11.8% were at risk of suicide according to the Plutchik scale	**Risk factors:**17.3% p (0.00) being female. 32.1% p (0.00) consumption of psychoactive substances 42.6% p(0.00) severe family dysfunction 25.9% p(0.00) family history of suicide 27.0% p(0.02) alcohol dependence 18.9% p(0.00) depression 40.0% p(0.00) psychological abuse
Bimala et al, 2015 Peru. Cross	970 students from 15 to 18 years of age in high school. Random probabilistic sampling.	26.3% suicidal ideation and 17.5% attempted suicide, according to a questionnaire based on the student health survey.	**Risk factors:** female gender (OR, 5.12; CI, 3.32–7.89) being insulted (OR, 2.31; CI, 1.60–3.34). Being attacked (OR, 2.09; CI, 1.41–3.10) perceived unhappiness (OR, 2.36; CI, 1.32–4.24). Smoking (OR, 1.70; CI, 1.08–2.66). having sexual intercourse (OR, 1.84; CI), 1.15–2.95 Sharing little with parents 2.35 (1.72–3.20) Not feeling understood by parents 2.42 (1.71–3.42) Psychoactive substance use 2.40 (1.42–4.04) Alcohol use 2.33 (1.71–3.17)
Pérez et al, 2012,	309 students from 12 to 17	Suicidal risk 47.6. 14.23% suicidal	**Risk factors:** Female gender (p = 0.001). Age greater than or equal to 15 years (p = 0.002). Low self-esteem 88.5% (p < 0.001). Severe family

Colombia. Cross	years of secondary school. Non-probabilistic sampling.	ideation in the last three months and 3.55% attempted suicide at some point in their lives, according to the youth health survey.	dysfunction 80%, the risk of suicidal behavior was significantly higher (p 0.001). Depression 78.1% p (0.001). Love disappointments 48.7% p (0.001) History of mental disorders 68% p=(0.002). Family history of having received treatment or hospitalization for psychiatry (60% p = 0.005). History of alcohol and/or drug use 36.5 p < 0.001). Family history of attempted suicide 68.4% (p = 0.045; OR 2.7)
Silva et al, 2017 Chile. Cross	919 students between 13 and 18 years of secondary school. Non-probabilistic sampling.	9% had attempted suicide in the last twelve months and 10.5% in the period prior to the last twelve months, according to Okasha.	**Risk factors:** female sex OR 3.14 p< (0.001). Parental absence OR 2.31 p(0.019). Not practicing any religion OR 1.2 p(0.019). History of attempted suicide in the parents 3.38 p(0.016). Tobacco use 2.51 p(0.001). Alcohol consumption 2.27 p(0.001). Drug use 3.59 p(0.001). Recent and past suicidal ideation OR 13.77 and 25.99 respectively p (0.001). Mean depression 19.95 t -9.349 p<(0.001). Average hopelessness 6.54 t -6.159 p<(0.001). Average stressful events 386.53 t -7.338 p<(0.001).
Valdivia et al, 2015 Chile. Cross	195 students from 14 to 20 years of high school.	16.4% had attempted suicide in the last twelve months and	**Risk factors:** female gender OR 3.42 p <0.001. Parental absence OR 4.35 p 0.003. Family dysfunction OR 2.17 P 0.046 and family dysfunction requiring immediate help OR 11.9 p <0.00. Drug use OR 3.9 p 0.021. Tobacco consumption OR 4.08 p<0.001. Very low self-esteem OR 2.61 p

	Stratified probabilistic sampling.	19.5% in the period prior to the last twelve months according to Okasha.	0.024 hopelessness at mild and moderate levels, OR 2.31; 3.91 and p 0.038; 0.004 respectively. Mild-moderate depression OR 6.77 P 0.001; moderate-severe OR 6.82 p <0.001 and severe OR 17.42 p <0.001. Both recent and past severe suicidal ideation, OR 37.14 P <0.001 and OR 65.14 P <0.001 respectively.
W.D. Et al, 2012, Jamaica. Cross	2997 students from 10 to 15 years of high school. Random probabilistic sampling.	9.7% suicidal ideas, according to the questionnaire constructed by the authors.	**Risk factors:** depression OR 5.78 times (CI 3.37, 9.90) Those who reported that they considered harming others OR 3.11 times (CI 2.03, 4.77). Women who engaged in aggressive behaviors or risky behaviors. Those who reported being teased/harassed in the last month. **Protective factors:** fiving in a rural area OR 0.62 (0.41-0.86). Self-esteem OR 0.58 (0.40-0.95). Family functionality OR 0.62 (0.43-0.90)
Cañon et al, 2018, Colombia. Transverse Analytical	180 students from educational institutions. Probabilistic sampling stratified by gender.	13.3% presented Suicide attempts, on average 2.4 times. According to questionnaire constructed by the authors.	**Risk factors:** 28.6 cigarette consumption PR 3.13 p 0.029. 37.5 family abuse PR 5.64 p0.000. 26.5% alcohol consumption PR 3.93 p 0.001. 42.3% anxiety PR 8.94 p 0.000. 24.44% low self-esteem PR p 0.000. 60% High bullying (bullying) p 0.001. **Protective factors**: 20.7% female PR 0.31 p 0.011. High self-esteem PR 1.

Sarmiento and Villalobos, 2011, Mexico. Correlational cross-sectional	1419 school students. Non-probabilistic sampling.	19.5% of suicidal ideas in women and 24.5% in men according to the suicidal ideation scale.	**Risk factors:** pearson correlations: Authoritative maternal style –.183. Authoritarian maternal style .195. Neglectful maternal style .241. Perception of the mother –.258 Frequency of conflict with the mother .267. Intensity of the conflict with the mother .247. Authoritative parental style –.194. Authoritarian parental style .158 Neglectful parental style .221. Perception of the father –.209. Family satisfaction –.287. Self-esteem –.444 Intensity of the conflict with the father .165 Negative affect .587. All p=0.000.
Alvarez et al, 2017, Cuba. Descriptive, longitudinal, retrospective	87 patients, with attempted suicide. Sampling for convenience.	Does not apply.	**Risk factors:** prevalence of the dysfunctional family, with 63 for 72.4%. A primacy of hereditary family history was found with 19.5%, followed by domestic violence with 18.3% and behavioral disorders and depression with 17.2%.
Cañon Et al 2017, Colombia. Analytical cross-sectional retrospective	73 medical records of patients over 12 years of age from Risaralda with attempted suicide.	Does not apply.	**Risk factors:** the consumption of psychoactive substances is 24.7% (lC95%:15.3%-36.1%), with marijuana being the psychoactive drug with the highest consumption by 21.9% (lC95%:13.1%-33.1%). The consumption of psychoactive substances is 24.7% (lC95%:15.3%-36.1%), with marijuana being the psychoactive drug with the highest consumption by 21.9% (lC95%:13.1%-33.1%). 54.8% (lC95%:42.7%-66.5%) of the population had a relative with a psychiatric history, where the mother and uncles represent 28.2%. Depression ranks first with 61.8%, followed by

	Sampling for convenience.		the use of psychoactive substances with 17.6%. 94.5% of the population did not have a family history of attempted suicide, but 32.9% (95% CI: 22.3%-44.9%) had a history of personal suicide attempt, carried out mostly by laceration and medication.
Cañon et al, 2021, Colombia. Cross	58 high school students. Sampling for convenience.	22.4% of the sample self-harmed, the most frequent type of injury was self-cutting with 92.3%. 46.2% of the population that self-harm presents more than one type of self-harm. 19% have made a suicide attempt in the last two years.	**Risk factors:** between depression and self-injurious behavior, it is observed that students who, according to the instrument used, present probable depression, in turn self-harm in a proportion of 38.36%, which drops to 4.71% among those who, according to the instrument, do not present depression. School harassment or intimidation (bullying), family satisfaction, probable anxiety and depression, tobacco use, alcohol use and psychoactive substance use. The strong association between suicide attempt and self-injurious behavior stands out (p=0.000, PR=47.25), for which it is inferred that self-injurious behavior is a strong predictor of suicide attempt, and of course completed suicide. Academic pressure and family abuse. **Protective factors:** religion (26.7% AC in those who have no religion, 22.5% in those who do, PR=0.946), support network (40% AC among those who do not have, 19.1% CA among those who do have, PR=0.742), extracurricular activities (27.8% CA among those who do not have, 20.5% AC among those who do have, PR=0.909).

Pineda et al, 2019 Colombia. Cross	175 participants aged 14-27 (mean, 19.02 ± 2.0) LGTBI years. Non-probabilistic snowball sampling	Just suicidal ideation. Positive and Negative Suicidal Ideation Scale (PANSI)	**Risk factors:** sexual abuse P 0.004 OR 4.418 CI (1.610-12.119). Internalized homophobia P 0.014 OR 2.289 CI(1.182-4.433). Chronological age P0.022 OR 3.392 CI (1.194-9.642) The correlation between suicidal ideation and chronological age was inverse and significant (rs =-0.21; p = 0.004), which indicates that the younger the age, the more prone to suicidal ideation in the studied participants. **Protective factors:** religious affiliation P 0.169 OR 0.645 CI (0.346-1.204)
Secundino et al, 2020, Mexico. Cross	409 high school students, aged between 15 and 19 years old (M = 16.46, SD = .96), 41.1% boys and 58.9% girls. probability sampling.	14.9% (n=61) had suicidal ideation, 13.4% (n=55) had symptoms of major depression, and 2.7% (n=11) had attempted suicide, according to Beck.	**Risk factors:** it was observed that being a girl (χ 2 = 13.570; p <.001; V = .18), having divorced parents (χ 2 = 6.346; p = .012; V = .13) and professing Catholicism (χ 2 = 8.032 ; p = .018; V = .14) were associated with a greater presence of suicidal ideation. Regarding substance use, it was related to tobacco (χ 2 = 10.265; p = .001; V = .16) and drug use (χ 2 = 12.811; p <.001; V = .18). She also showed an association with having suffered psychological and/or physical violence (49.2 vs. 17.8; χ 2 = 29.286; p <.001; V = .27). having suffered from anxiety in the last six months (χ 2 = 24.888; p <.001; V = .25), high depressive symptoms (χ 2 = 127.907; p <.001; V = .56), automatic negative thoughts (χ 2 = 129.474; p <.001; V = .56) and suicide attempts (χ 2 = 51.444; p <.001; V = 0.36).

Suarez et al, 2018 Colombia. Cross	210 adolescents between 12 and 19 years old, from secondary school. Non-probabilistic sampling.	31.4% of adolescents with suicidal risk. Plutchik	**Risk factors:** suicide risk in adolescents is significantly associated with exposure to violence at home (OR= 2.330 95% CI=1.284-4.228), gender (OR= 4.151 95% CI=2.114-8.151) and difficulties entering education . **Protective factors**: support from parents/siblings/friends (OR= 0.255 CI95%=0.094-0.693).
Pérez et al, 2017, Colombia. Cross	1292 High school students from Boyacá. Stratified probabilistic sampling.	43% positive suicidal ideation 15.38% attempted suicide. Positive and Negative Suicidal Ideation (PANSI)	**Risk factors:** sexual abuse by penetration and suicidal ideation chi-square 20 694 and bilateral significance less than 0.05. suicidal attempt and sexual abuse by touching was 159,068 and a significance of 0.00. The chi-square value was 138,065 and the significance was 0.00 for attempted suicide and penetrative sexual abuse.
Martinez et al, 2020, Cuba. Cross-sectional	46 adolescents with suicide attempt. Non-probabilistic sampling.	Does not apply	**Risk factors:** 68% broke the relationship with their partners, especially in the female sex. The insufficiency of emotional resources in adolescents to manage conflicts and problems in the couple relationship was perceived. 73.9%, within which parental violence, family separation and family neglect were observed. Adolescents with suicide attempts have psychiatric

retrospective, descriptive			illnesses that were diagnosed and treated in some cases, while in others they were not. depression and personological characteristics such as manipulation and impulsiveness.
Garza et al, 2019, Mexico. Correlational cross-sectional	185 students from 12 to 15 years of high school. Incidental non-probabilistic sampling.	8.1% suicidal ideation, of which 6.5% have thought about it from one to three times and 1.6% have thought about it five to six times. Of those who have thought 4.9% try.	**Risk factors:** according to the perception of adolescents, they mention bullying (83%), family violence (69.7%), mental problems (61.6%) and parental divorce (53%) as the main causes of suicide. Higher level of hopelessness in men, positive type correlation, as long as someone in his family has offended or insulted the adolescent, he has ever thought about committing suicide (.198), a person close to him has tried or committed suicide (.211) and some of their friends have mentioned suicide as a way out of their problems (.375)
Pinzon et al, 2013, Colombia. Cross Section Analytics	963 medical students. Non-probabilistic sampling.	15.7% (n = 149) serious suicidal ideation throughout life. 5% (n= 47)	**Risk factors:** clinically significant depressive symptoms (OR: 6.9; 95% CI: 4.54-10.4), history of illicit psychoactive substance use (OR: 2.8; 95% CI: 1.6-4.8) and perception of regular or poor academic performance during the last year (OR: 2.2; 95% CI: 1.38-3.63).

		suicide attempt. 13.9% (n= 131) took antidepressants. According to CES-D Scale.	
Mendez et al, 2022, Chile. Cross Section Analytics	388 teenagers from 10 to 21 years old admitted to the mental health system. Non-probabilistic sampling	58.0% had non-lethal self-harm, 30.4% presented passive suicidal ideation during the last month, while 45.9% some once in his life. 18.8% reported suicidal ideation active during the last month and 41.0% at some time in their life.	**Risk factors:** belonging to the LGTBIQ+ community, not being religious, female sex, impulsivity, history of self-harm, having been a victim of sexual harassment and/or abuse. All these correlations were performed using multiple correspondence analysis.

33.2% had a history of previous attempts, 55.0% had made two or more attempts.

Appendage 3.

Vote counting and sign test

Risk factors variable	**positive**	**negative**	**P value**	**n=20**
Cigarette consumption	5	2	0.2266	7
Consumption of psychoactive substances	8	2	0.0547	10
Severe family dysfunction	5	1	0.1094	6
Alcohol consumption dependence	5	2	0.2266	7
low self-esteem	5	0	0.0313	5

Sexual abuse	3	0	0.1250	3
School bullying	4	3	0.5000	7
Depression	9	4	0.1334	13
Psychological abuse	2	0	0.2500	2
Female sex	5	1	0.1094	6
Being insult	1	1	0.7500	2
Academic performance	0	2	0.2500	2
Divorced parents	1	1	0.7500	2
Love disappointments	1	1	0.7500	2
Recent and past suicidal ideation	2	0	0.2500	2
anxiety	2	1	0.5000	3
Family abuse	4	2	0.3438	6
Family history of suicide attempt	4	0	0.0625	4
Parental absence	2	1	0.5000	3
Medium hopelessness	3	0	0.1250	3