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Suicidal and self-harm behavior in adolescents, an unsolved problem. A comprehensive review

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SUMMARY

In recent years, an increase in the prevalence of suicidal behaviour and completed suicides among children and young people have been observed. Considering adolescence as a sensitive point where actions to promote emotional wellbeing can be implemented, we consider relevant the analysis of suicidal behaviour in this population. For this purpose, this paper carries out a comprehensive review of the topic of interest, structuring the work under the following headings: phenomenon conceptualization, risk factors, explanatory models, assessment instruments, effective psychotherapeutic interventions and current prevention plans. The conclusion is that while multiple intervention strategies have been developed, the increase in the prevalence of suicide justifies the implementation of new programs with appropriate, concrete and feasible content.

Keywords. "Self-Injurious Behaviour", "Nonsuicidal Self Injury", "suicidal ideation", "suicide attempted"

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CONDUCTA SUICIDA Y AUTOLESIVA EN ADOLESCENTES, UN PROBLEMA SIN RESOLVER. UNA REVISIÓN COMPRENSIVA

RESUMEN

En los últimos años se ha observado un aumento de la prevalencia de la conducta suicida y de los suicidios consumados en la población infantojuvenil. Entendiendo la adolescencia como una ventana sensible en la que implementar actuaciones de promoción de bienestar emocional, consideramos pertinente el análisis de la conducta suicida en esta población. A tal efecto este trabajo realiza una revisión comprensiva sobre el tema de interés, estructurando el trabajo en los siguientes epígrafes: conceptualización del fenómeno, factores de riesgo, modelos explicativos, instrumentos de evaluación, intervenciones psicoterapéuticas eficaces y planes actuales de prevención. Se concluye que aún habiendo diseñado múltiples estrategias de intervención, el aumento de prevalencia del suicidio justifica el diseño de nuevos programas con contenidos apropiados, concretos y factibles.

Palabras clave. Conducta autodestructiva, autolesión no suicida, ideación suicida, intento de suicidio

INTRODUCTION

Adolescence is a period of high vulnerability, characterized by an identity crisis defined by at least three evolutionary tasks: individualization of the family group, development of a sense of identity and belonging, and positioning around gender identity. Although this process is highly mediated by the culture and family history of each subject, we cannot disregard the influence of certain evolutionary aspects, such as the different rhythm of maturation of different areas in the brain, being the prefrontal cerebral cortex, which is the support of executive functioning and behavior regulation, the last to complete its development[1]. In accordance with the aforementioned, the maturational imbalance between the frontal areas and the mesolimbic system, related with motivation and reward, could explain that adolescents have less awareness of the negative consequences of their behavior[2].

On the other hand, specific factors of psychological development also play a role, such as the development of metacognition; defined as the ability to reflect on one's own thought processes, and abstract reasoning; established as the ability to isolate a specific property or function of an object. Despite the fact that all these elements facilitate the appearance of complex representations, such as the idea of one's own death, the cognitive processes of threat response that are triggered by these thoughts are still

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under development, with more rudimentary and automatic coping strategies prevailing, such as rumination and catastrophizing[3,4].

It is also necessary to understand the influence of the current postmodern context, mediated by technology, where identity is built on inexhaustible, transitory and external elements to the individual[5], preventing the development of effective emotional regulation strategies. In this way, there is growing literature that associates the excessive use of digital media with adverse physical, psychological, social and neurological outcomes[6]. From the physical point of view, sleep disorders, hyperactivation of the sympathetic nervous system and deregulation of cortisol secretion stand out. In relation to the psychoneurological effects, there seems to be an anxiogenic behavior similar to that observed in addictive behaviors, in addition to a decrease in the capacity for social coping.

Additionally, there is a relationship between the use of social media and emotional regulation in which young people with emotional instability are more likely to have problematic use of the social media, if they use them to try to control their mood, search for comfort and coping against negative affect[7]. On the other hand, the problematic use of social media could also be an antecedent of emotional dysregulation, in this sense, there are studies[8,9] that indicate the co-occurrence of the problematic use of social media with the emotional distress of children and adolescents.

Understanding adolescence as a sensitive window, in which to implement actions to promote emotional well-being, it is paramount to analyze suicidal behavior in this population for the following reasons:

1. Death by suicide represents 8.5% of deaths among adolescents and young adults, becoming the 2nd leading cause of death in this age group[10], surpassing accidents during the pandemic[11].

2. An increase in the prevalence of suicidal behavior and completed suicides has been observed in the child and adolescent population[12].

3. More and more suicides are recorded at younger ages[12].

4. Most adolescents who attempt suicide communicate their ideation before carrying it out. For this reason, the community must be alert to warning signs[13].

5. The impact that suicide produces on the family and on society is significant.

Therefore, the objective of this study is to review the literature on suicidal behavior in adolescents, classify its content and establish the bases for future research.

METHODS

To carry out this review, a bibliographic search was carried out in health sciences databases, using keywords related to suicidal behavior in MeSH terms "Self-Injurious Behaviour", "Nonsuicidal Self Injury" "Suicidal Ideation" and "Attempted Suicide". The reason why comprehensive MeSH descriptors were used is due to the different conceptualization of suicidal behavior between European and North American publications. Thus, while European research teams include suicide attempts and self-harm behaviors in the "self-harm" formula; American researchers differentiate between suicidal behavior and self-harm.

Regarding the methodology, different formulas were used with the keywords indicated in the PubMed and Embase search engines with Boolean operators AND, OR and NOT. Although works prior to 2015 were initially rejected, in a second step 5 publications prior to the predetermined date were used. Specifically, one publication from the year 2009, one publication from the year 2011, two publications from the year 2012 and one publication from 2013 were used. Meta-analyses, clinical trials, systematic and non-systematic reviews that included the child and adolescent population and that also answered critically and comprehensively to the questions raised on the topic of interest were selected: definition of suicidal behavior, risk factors in adolescents, explanatory paradigms, clinical evaluation, effective psychological interventions and prevention of suicidal behavior in the adolescent population.

CONCEPTUALIZATION

Suicidal behavior refers to a set of thoughts and behaviors related to intentionally ending one's life. It is important to define the difference between self-harm and suicidal behavior thoroughly, as they are both; conceptually and phenomenologically, different phenomena[14]. Thus, from a conceptual point of view, self-harm differs from suicidal behavior in intentionality, frequency and lethality. From a phenomenological point of view, they present diametrically opposed characteristics: those who wish to die want to "get out of life and stop feeling", while those who self-injure want to "stay alive and feel". In this sense, the hypothetical functions of non-suicidal self-harm have been studied, finding a strong level of evidence in the search for emotional regulation, that is, the ability of individuals to maintain, intensify or inhibit, consciously or unconsciously, the aspects behavioral, cognitive, experiential or physiological aspects of emotional arousal[15] and self-punishment[16].

In addition, the positioning of international classification systems should be taken into consideration.

On the one hand, the ICD-11[17] does not recognize its own diagnosis for suicidal behaviours, considering them as clinical manifestations associated with other conditions, differentiating between the following categories:

a. Nonsuicidal Self-Injury: Intentionally self-inflicted injury to the body, usually by cutting, scraping, burning, biting, or hitting, with the expectation that the injury will result in only minor physical harm.

b. Suicidal ideation: set of thoughts, ideas or musings about the possibility of ending one's life, ranging from thinking that one would be better off dead to formulating elaborate plans.

c. Suicidal behavior: Specific actions, such as buying a gun or stockpiling medication, that are done in preparation for fulfilling one's wish to end one's life, but do not constitute an actual suicide attempt.

d. Suicide attempt: a specific episode of self-destructive behavior, carried out with the conscious intention of ending one's own life.

On the other hand, in the DSM-5 and in previous versions of the manual[18,19], suicide is conceptualized mainly as a specific symptom of Major Depressive Disorder (MDD) and Borderline Personality Disorder (BPD), or as a possible negative consequence of other psychiatric diagnoses[19]. However, suicidal behavior disorder is one of the eight disorders for further study that is included in Section III of DSM-5. As currently proposed, a diagnosis of Suicidal Behavior Disorder requires that an individual meets the following five diagnostic criteria

A. Within the last 24 months, the individual has made a suicide attempt.

B. The act does not meet criteria for nonsuicidal self-injury.

C. The diagnosis is not applied to suicidal ideation or to preparatory acts.

D. The act was not initiated during a state of delirium or confusion.

E. The act was not undertaken solely for a political or religious objective.

This new diagnosis category includes two specifiers: "current" (no more than 12 months since the last attempt) and "in early remission" (12-24 months since the last attempt). The criteria also clearly define "suicide attempt" as "a sequence of behaviors self-initiated by an individual who, at the time of initiation, expected the set of actions to lead to their own death"[18,19]. This diagnosis is also differentiated from another condition for further study, "non-suicidal self-injury".

RISK FACTORS

Suicide is a multifactorial, plural and contextual reality, in which several problematic configurations exist for each subject and these can be the basis for numerous psychological problems. The scientific literature has studied numerous risk factors: environmental, contextual, biological and psychological[12,20] without being able to precisely define the interactions that can be established between the different risk factors or the role played by each factor separately. Likewise, limitations have been observed in the studies that analyze the risk factors[20] by noting that in most of the works the risk factors were classified based on statistical results, disregarding their clinical importance. On the condition of expanding the focus and avoiding reductionist perspectives, the review of risk factors is articulated around four different axes:

a. Studies that evaluate the predictive capacity of risk factors. To this end, the meta-analysis of 50 years of research by Franklin et al. is taken as a starting point, where the power and precision of risk factors in suicidal behavior are reviewed[21]. Several unexpected findings were described, as risk factors were revealed to be weak and inaccurate predictors of suicidal behavior, as well as pointing out that the predictive capacity has not improved in the last 50 years[22]. In parallel, Franklin questions the scientific validity of many taxonomies, arguing that in most guidelines risk factors are articulated as lists of relatively non-specific factors that could be present in the general population[23]. In short, Franklin highlights the idea that, until now, no clear conclusion has been reached regarding the predictive value of risk factors in suicidal behavior.

b. Works that articulate the correlates and risk factors in environmental, psychological and biological dimensions[12]. These studies establish child abuse and peer bullying as primary environmental risk factors, pointing to mixed evidence regarding peer and media influence. Regarding the psychological correlates, these works organize the psychic processes in affective components (emotional value of the perceived stimuli), cognitive (impulse control and information processing biases) and social (commitment in interpersonal relationships), conforming

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as risk factors when its functioning is altered. Finally, regarding the biological aspects, there could be alterations in brain circuits (i.e., in the regions of the cerebral cortex involved in goal-directed behavior, decision-making and emotion regulation) and/or molecular dysfunctions of monoaminergic systems and/or genetic factors (i.e., polymorphism in the promoter region of the serotonin transporter gene (5-HTTLPR)).

c. Methodological limitations in studies linking antidepressant therapy with increased suicide rates. Specifically, these investigations have not come to refine the biological, psychological and social factors that influence suicidal behavior, lacking sufficient statistical strength[24]. Thus, in the vast majority of studies presented to the scientific community, follow-up is limited to less than 12 weeks, and it is not possible to assess the impact of long-term treatment. Similarly, as antidepressant treatment is prolonged, the risk of attempted and completed suicide is considerably reduced[24]. Consequently, the American Academy of Child and Adolescent Psychiatry (AACAP) (24) suggested that the FDA not apply the "black box warning" to antidepressants in childhood depression, considering that the potential benefits of treatment outweigh the risks. In any case, the risk of suicide is inherent to depressive disorder and the described risk would be in the latency of response to antidepressant treatments.

d. Elements that can be constituted simultaneously as risk and protection factors. At this point we highlight the Internet and social networks, finding "pro-suicide" pages (cyber-bullying, pro-suicide games, information on suicide methods) and anti-suicide pages (support sites, help lines and forums for prevent suicide)[25]. Following this theoretical line, two constructs have been formulated that account for the impact of new technologies on the population. Thus, the Werther Effect[16] refers to the influence of the representations of suicidal acts on the frequency of suicide, as factors associated with imitation: the amount of media coverage, the similarity of the adolescent with the victim and the romantic or sensationalist report, among others. In this sense, the impact of the Netflix series "13 Reasons Why"[26] has been studied, a fiction in which an adolescent commits suicide, observing after its broadcast a slight increase in the monthly suicide rate in young Americans aged between 10 and 17 years old. Similarly, the Papageno effect[27] refers to the protective influence that the media can exert on suicidal behavior, considering that these agents actively intervene in the construction of social reality. To this end, the WHO has published a document that recommends how to deal with suicidal behavior in the media and promote preventive actions without spreading myths[27].

Taking all of the above into account, and understanding mental health as the interplay of biopsychosocial factors in a particular biography, the adequate discrimination between explanatory processes (i.e, parenting style), psychological phenomena (i.e., dysfunctional coping strategies), biological mediators (i.e., impulsiveness, hopelessness) and moderators (contextual and socioeconomic factors) is relevant.

EXPLANATORY MODELS

Suicidal behavior has been analyzed from multiple theoretical models[2,28,29,30,31,32,33,34,35,36,37,38]. Regarding childhood and adolescence, we highlight the following:

1. Mann's diathesis-stress model[28]. This is a hypothetical and predictive framework that postulates that, in order to reach the threshold of suicidal behavior, there must be two factors: a precipitant (stress) and an individual vulnerability (diathesis). Mann's model conceptualizes diathesis as a dynamic condition of a continuous nature, emphasizing that it can vary during life and that it is not dichotomous.

2. Neurocognitive model of Jollant et al[29,30]. Model developed based on neuropsychological findings in subjects with suicide attempts. This model claims for the existence of neurocognitive, such as a low capacity for emotional regulation and failures in cognitive processing.

3. Contextual phenomenological model[31]: Presents suicidal behavior as an open-contextual-existential reality, considering the future of the human being as a dramatic event, where the circumstance of life with its problems and the possibility of choosing are present. The act of suicide stands out as one of those possibilities.

4. Network analysis[32]: Theoretical model that conceptualizes psychopathological disorders as a complex and dynamic system of symptoms and signs. From this approach, the symptoms are not configured as simple passive consequences of a common disorder, but rather have autonomous causal power. Its objective is to analyze the psychological mechanisms that underlie the appearance and maintenance of mental health problems.

Although suicidal behavior and self-harm are distinct phenomena and the categorical separation at the theoretical level is clear, different studies[2] seek a comprehensive approach, analyzing the relationships that may exist between the two. Consequently, integrative theoretical models have been proposed[2]:

1. The Gateway theory[2] establishes self-harm and suicidal behavior as two manifestations of the same behavior, understanding self-harm as behaviors that precede suicidal behavior[2]. According to this approach, non-suicidal self-injury represents a "gateway" that tends to precede lethal intent.

2. Theory of the common variable[33]. This paradigm proposes the existence of a common variable (i.e., psychiatric disorder, low self-esteem or lack of social support) that explains the co-occurrence of suicide attempts and non-suicidal self-harm in the same person.

3. Joiner's interpersonal theory[34]: Considers self-injury and behavior as a continuum, adding the variable of pain modulation. Thus, repetitive self-injurious behaviors favor phenomena of tolerance and insensitivity to pain, constituting a training pathway for suicide[2,35].

4. Integrated model with specific predictions about the link between self-harm and suicidal behavior from Hamza et al[36]. This theoretical framework considers that self-harm directly predicts suicidal behavior, as proposed by the gateway theory, and that this association is moderated by levels of intrapersonal distress. Likewise, in accordance with the theory of the common variable, it considers that shared risk factors can predict both self-harm and suicidal behavior. At the same time, it takes into account the acquired capacity for suicide presented by Joiner's interpersonal theory. In this way, it exposes that the relationship between self-harm and the acquired capacity for suicide is moderated by the severity of the self-harm, and that the relationship between the acquired capacity and suicidal behavior is moderated by the perception of personal burden and frustrated belonging.

Although each of the theories offers different explanations for why self-harm and suicidal behavior may be related, the existing research on the topic does not clearly support one theory over the others.

EVALUATION

Understanding suicidal behavior as a complex reality, where contextual, interactive and personal factors intervene, different authors[37,38,39] structure the evaluation of suicidal behavior in two stages. In this way, they propose to carry out at first, a quantitative, topographical or screening evaluation, which would allow to determinate the suicidal risk. Once the risk is established, in a second stage, a comprehensive assessment of the autolytic process should be performed, this is, trying to understand what is "happening" to the patient[40].

Specific tests have been designed for screening evaluations, among which the following stand out:

a) Columbia Suicide Severity Rating Scale (C-SSRS)[41]. Designed to distinguish ideation from suicidal behavior, based on the evaluation of four constructs: severity of thoughts, intensity of ideation, behavior (current, aborted and interrupted attempts; preparatory behaviors; and non-suicidal self-injurious behaviors) and lethality.

b) SENTIA Scale[42]: Instrument composed of 16 items in a dichotomous format (yes/no) that measures a general factor of suicidal behavior and three specific factors (suicidal act/planning, communication and ideation). The recently validated SENTIA-Brief questionnaire[43], made up of 5 items, assess key constructs, such as desire (Have you wished you were dead?), ideation (Have you had ideas of taking your own life?), planning (Have you planned to kill yourself?), communication (Have you told someone you want to kill yourself?), and behavior (Have you tried to kill yourself?).

c) Suicide Behaviors Questionnaire-Revised (SBQR)[44]: Self-administered questionnaire designed to identify risk factors for suicide in children and adolescents between 13 and 18 years of age. There are 4 questions that can be answered in a few minutes and one of its greatest advantages is the temporary exploration of suicidal behavior. The questions that make up the SBQR are as follows:

   1/ Have you ever thought about or tried to commit suicide?

   2/ How often have you thought about committing suicide in the last year?

   3/ Have you ever told someone that he was going to commit suicide or that he might do it?

   4/ What is the probability that you will try to commit suicide one day?

d) Paykel Scale[45]: Tool originally designed for the evaluation of the different manifestations of suicidal behavior in a clinical population. It consists of five items with a YES/NO dichotomous response system. Scale made up of the following questions:

   1/ Have you felt that life is not worth living?

   2/ Have you wished you were dead? For example, going to sleep and wishing not to get up,

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3/ Have you thought about taking your own life even if you really weren't going to do it?

4/ Have you reached the point where you would actually consider taking your own life or did you make plans on how you would do it?

5/ Have you ever tried to kill yourself?

e) Momentary ecological evaluation[46,47]: Evaluation through mobile applications that allows the collection of behavioral data through implicit measurements (smartphone sensors) and explicit measurements (contextual questions) in real time, in naturalistic environments and with multiple repeated measures.

For a comprehensive, global and contextual evaluation of suicidal behavior, a detailed clinical interview should be also done in addition, to fully understand the adolescent's behavior. Likewise, problematic contexts, the support network and coping strategies should be examined, emphasizing those that are potentially modifiable with clinical or social intervention.

Finally, it should be noted that in the emergency department, the evaluation must include a physical and psychiatric examination, the compilation of the complete medical history of the patient (with information on the patient, his parents and significant others)[16], the analysis of psychosocial stressors, the current mental exam, and the stressors and/or circumstances accompanying the suicide attempt.

The level of risk is stratified based on the psychopathological examination, the evaluation of the individual's strengths (coping strategies and therapeutic bonding) and socio-family support.

EFFECTIVE INTERVENTIONS

Some psychotherapeutic interventions are effective:

a) Dialectical behavioral therapy for adolescents (DBT-A)[48,49,50], established as the psychotherapeutic treatment that has reached the highest level of evidence and degree of recommendation in the scientific literature. The objectives of this therapy are the reduction of automatic behaviors and the acquisition of emotional regulation skills, tolerance to frustration and the construction of a life worth living.

b) Individual cognitive-behavioral therapy (CBT)[51,52,53] remains a therapy without solid measured evidence for suicidal behavior. However, studies presenting the combination of individual and family CBT have been shown to be more effective than individual CBT.

c) SAFETY Program (Safe Alternatives for Teens and Youths)[54,40]. It includes elements of CBT, DBT-A and social ecological theory. It also includes two lines of treatment: First step: Individual treatment with adolescents and parent training with another therapist. Second step: Joint family sessions where the necessary skills are trained.

On the other hand, interventions that have empirical support derived from quasi-experimental studies or a single randomized controlled trial[40] are indicated, establishing them as probably effective therapies[52]. These are: Interpersonal Psychotherapy for Adolescents (IPT-A)[55], Integrated Cognitive Behavioral Therapy (I-CBT)[56], Mindset-Based Therapy for Adolescents (MBT-A)[57], Program for Parents and Adolescents (RAP-P)[58], Social and educational support (YST)[59].

Empirically Supported Brief Psychological Interventions

These interventions can be carried out in a single session, even by telephone or other non-face-to-face means. In general, the goal is to help people analyze the personal components linked to suicidal behaviors and forge a therapeutic alliance so that they commit to their safety and seek help in times of crisis. These are:

1. Security Plan[60]. It is considered one of the best practices of brief intervention. It is crucial to identify the "key" adults who can be part of the plan and that must be chosen by the adolescents. The basic components of the safety plan include recognizing warning signs, employing coping strategies, utilizing social/family/professional contacts, and reducing access to lethal force

2. Teen Options for Change (TOC)[40]: Intervention designed for adolescents who come to the emergency department and who are at risk of suicide after screening. The theoretical framework in which it is integrated is that of the theory of self-regulation and change. Likewise, it incorporates the motivational interview as a therapeutic tool.

3. Family intervention for Suicide prevention (FISP)[40]: Intervention adapted to help the adolescent and his family to develop coping skills, increase their motivation for treatment and access the outpatient mental health center.

4. As safe as possible (ASAP)[61]. Brief hospital intervention whose objective is to increase protective factors against recurrent suicidal behavior. The intervention

incorporates a phone application (called BRITE®) that encourages emotion regulation and helps create a personalized safety plan during the transition from inpatient to outpatient care. The intervention is made up of four modules: 1/ Psychoeducation, therapeutic adherence and safety plan, 2/ Emotional regulation 3/ Sensitization to change, 4/ Review, consolidation and follow-up through the telephone application.

PREVENTION

The prevention of suicidal behavior begins with the definition and monitoring of the problem, to continue then with the evaluation of risk and protection factors. Once identified, interventions must be developed and evaluated to scale up effective programs and policies[62]. In this context, the European task force for suicide prevention[62] developed a statement that, based on the results of systematic studies, summarized the minimum requirements that national suicide programs should include. The strategies with the highest levels of evidence established two complementary levels of action: one from the field of public health (carry out school interventions and promote restriction to lethal means) and another from the health services (multidisciplinary approach to suicidal behavior and adequate treatment)[62]. Likewise, in the United States, the National Action Alliance for Suicide Prevention presented the Zero Suicide (ZS) Model[63] that elaborates a multilevel coordination framework to implement evidence-based practices. These practices include the SAFE-T evaluation (a five-step evaluation that analyzes the patient's level of suicide risk and suggests appropriate interventions) in the emergency department[63], the elaboration of a safety plan and the Brief program Intervention and Contact (BIC)[64]. This program consists of an intervention in the emergency department and nine contacts or visits during 18 months at 1, 2, 4, 7, and 11 weeks and at 4, 6, 12, and 18 months.

Following international recommendations, in Spain, the different regions have designed specific strategic plans. We highlight the ARSUIC program of the Community of Madrid[65], implemented since 2014 with the aim of guaranteeing continuity of care for patients with potential suicidal risk, ensuring an outpatient follow-up appointment at the Mental Health Service within a week. On the other hand, it should be noted that the 2021-2025 Suicide Prevention Plan (PLAPRESC)[66,67] has recently been presented in Catalonia. This program establishes the following actions: a follow-up appointment at a mental health center within 10 days for adults and 72 hours for those under 18 years of age from hospital discharge, control telephone call within 30 days, follow-up appointments follow-up for a period of 12 months in the mental health network and post-prevention functions[67].

CONCLUSION

This is a comprehensive review of suicidal behavior in the adolescent population. Even after designing multiple intervention strategies, the increased prevalence of adolescent suicide justifies new programs with appropriate, concrete and feasible content.

It is therefore paramount to understand the mediating and moderating variables, as well as protocoled interventions that allow an optimization of the prevention tools.

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