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Scientometric analysis of research trends on suicidal risk in childhood and adolescence

Análisis cientiométrico sobre tendencias de investigación del riesgo suicida en la infancia y la adolescencia

Análise cientiométrica das tendências de pesquisa sobre o risco de suicídio na infância e adolescência

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Abstract: The aim of this bibliometric paper was to analyze the scientific production on biopsychosocial risk factors leading to suicide in childhood and adolescence using graph theory. The Scopus (Elsevier) and Web of Science databases were consulted and the analysis was performed using bibliometrix, Sci2 tool and Gephi. A total of 2,058 records were found. The analysis of the records revealed a citation network of 2,905 records and four main clusters. The results showed a network structure of knowledge production behavior in four research trends: (1) psychiatric predictors of suicidal behavior in children and adolescents; (2) association between non-suicidal self-injurious behavior and suicidal behavior in adolescents; (3) relationship between child abuse and suicidal behavior; (4) use of antidepressants in childhood and adolescence and suicidal behavior. Finally, considerations for suicide prevention in the study population are raised.

Keywords: suicide; risk factor; graph theory; childhood; adolescence

Resumen: El objetivo del presente estudio bibliométrico consistió en analizar la producción científica acumulada sobre los factores de riesgo biopsicosocial conducentes al suicidio en la infancia y la adolescencia mediante la implementación de la teoría de grafos. Se consultaron las bases de datos Scopus (Elsevier) y Web of Science, y el análisis se efectuó en bibliometrix, Sci2 tool y Gephi. Se encontraron 2,058 registros. El análisis mostró una red de citaciones de 2,905 registros y cuatro clústeres principales. Los resultados arrojaron una estructura de red de la producción de conocimiento en cuatro tendencias de investigación: (1) factores de predicción de tipo psiquiátrico del comportamiento suicida en niños y adolescentes; (2) asociación entre conducta autolesiva no suicida y comportamiento suicida en adolescentes; (3) relación entre maltrato infantil y suicidio; (4) uso de antidepresivos en la niñez y adolescencia y comportamiento suicida. Finalmente, se plantean consideraciones para la prevención del suicidio en la población objeto de estudio.

Palabras clave: suicidio; factores de riesgo; teoría de grafos; infancia; adolescencia

Resumo: O objetivo deste estudo bibliométrico foi analisar a produção científica sobre os fatores de risco biopsicossociais que levam ao suicídio na infância e adolescência utilizando a teoria dos grafos. Foram consultadas as bases de dados Scopus (Elsevier) e Web of Science e a análise foi realizada no bibliometrix, Sci2 e Gephi. Foram encontrados 2058 registros. A análise revelou uma rede de citações com 2905 registros e quatro clusters principais. Os resultados geraram uma estrutura de rede de produção de conhecimento em quatro tendências de pesquisa: (1) preditores de tipo psiquiátrico de comportamento suicida em crianças e adolescentes; (2) associação entre comportamento autolesivo não suicida e comportamento suicida adolescente; (3) relação entre maltrato infantil e suicídio; (4) uso de antidepressivos na infância e adolescência e comportamento suicida. Por fim, são propostas considerações para a prevenção do suicídio na população em estudo.

Palavras-chave: suicídio; fatores de risco; teoria dos grafos; infância; adolescência



The suicidal behavior in child and adolescent population is constituted as a worldwide public health problem given the high prevalence reported of suicidal behavior, the associated mental health problems evidenced in attempted or consumed suicide, the associated family dysfunction reported, the school violence reported, and the high costs in the health system (Gómez et al., 2022; Núñez et al., 2023).

Different studies have reported that suicide is the second cause of death in people between 10 and 34 years old (Centers for Disease Control and Prevention, 2020; Iwatate et al., 2023), and the third between 10 and 19 years old (Liu et al., 2023). According to the World Health Organization (2021), approximately 703,000 people commit suicide each year, making it the fourth cause of death among adolescents between 15 and 19 years of age worldwide. Between January and November 2022, 453 cases of suicide were documented in the range of 5 to 19 years old in Colombia. A total of 186 cases of suicide were reported within this period of the life cycle, between 15 and 17 years old (National Institute of Legal Medicine and Forensic Sciences, 2022). The above figures illustrate the magnitude of the phenomenon. Therefore, it is important to carry out analysis of the accumulated evidence on suicide risk factors, in order to generate knowledge about the state of the art, identify lines of research, publication trends, as well as theoretical and empirical gaps.

The suicidal behavior is understood as a dynamic, multifactorial, and stepwise process of diverse expressions, ranging from the desire for death, the suicidal representations and ideas, the suicidal gesture to the attempted and completed suicide. These are fundamental aspects that help in the identification of the suicidal risk, and thus important in the design of early detection processes and psychosocial approach of childhood and adolescence (Gómez et al., 2019; Gómez et al., 2020).

Relationships have been found between persistent suicidal ideation and mental health problems such as depression, psychoactive substance use and emotional regulation problems (Aparicio Castillo & Blandón Rodríguez, 2020; Gomes et al., 2022; Mars et al., 2019). It has also been found that impulsivity is a high risk factor in the progression from plan to suicide attempt (Arango Tobón et al., 2021).

Several risk factors related to suicidal behavior in the child and adolescent population have been documented in various studies (Benavides-Mora et al., 2019; Rice et al., 2022), among which the following stand out: (1) cognitive factors such as unhealthy coping mechanisms, maladaptive schemas related to hopelessness and deficits in impulse control; (2) emotional factors, specifically mood disorders such as major depression; (3) behavioral factors, the most frequent being behavioral disorders, as well as substance use and abuse; and (4) social factors, such as family dysfunction, psychosocial vulnerability, poor interpersonal relationships, psychosocial stress and few free time spaces. Predisposing factors for suicide attempts have also been reported, such as family history of suicide, experiences of bullying, physical, psychological, and sexual abuse, in addition to genetic variables (Siddik et al., 2024; Sun et al., 2024).

The above findings show the diversity of factors associated with suicide in the child and adolescent population, which has led to the development of research that synthesizes scientific advances and allows us to have a clearer picture of this phenomenon. In a meta-analysis on trauma and suicide attempts, it was found that children who had witnessed domestic violence and have been victims of physical abuse, sexual abuse, and neglect caregivers were more likely to present self-harming behaviors (Zatti et al., 2017). However, this research included a small number of studies, then it was suggested that more research needed to be conducted in this regard.

It was concluded in a study that there is a solid association between the exposure to parental suicide and child suicide behavior. Therefore, it is essential to develop suicide prevention actions for young people in duel. However, as a limitation of the study, it was reported that the analyzed samples were selective and results couldn't be generalize given that they included participants who attended support groups and who had received grief support, so it was not clear whether the findings related to the post-traumatic growth could be applied to bereaved people who had not received similar treatments (Hua et al., 2019). Unlike the above, in another systematic review, Hua et al. (2020) found that some children bereaved by parental suicide could demonstrate high levels of resilience and post-traumatic growth, which contributes to their ability to overcome grief.

Benavides-Mora et al. (2019) conducted a review of the accumulated evidence of suicide in Colombia between 2004 and 2018 using the PRISMA methodology. However, the results presented were general findings on child and adolescent suicide in terms of age groups, instruments and theoretical perspectives of the studies reviewed. Additionally, they suggested the need to continue carrying out

longitudinal studies and to deepen theoretical models that would allow suicide risk factors to be more clearly integrated.

Recent bibliometric studies have explored the progress of research about the phenomenon of suicide (Astraud et al., 2021; Gómez, 2022; Grover et al., 2021) with a special interest in analyzing the number of publications, citations of the most influential authors, journals, organizations, countries, and research areas. These studies are useful for mapping trends in the advancement of scientific publications, also, it is important to permanently analyze the production of knowledge about suicidal behavior in children and adolescents. However, there are few bibliometric studies implemented graphic algorithms based on graph theory to identify research trends. As graphic algorithms allow the interpretation of the variables based on a mixed correlational quantitative analysis with graph metrics and a qualitative analysis through associations between the nodes or concepts (Blanco Correa et al., 2020), this technique can enrich knowledge around the research of suicide, and its risk factors in different populations of boys, girls, and adolescents.

Considering the above, it is necessary to analyze the research trends and the variables related to suicidal behavior in children and adolescents, as well as the different aspects of the variables involved in suicidal risk, to understand the current stay of the research about the suicide risk factors. This helps in the identification of knowledge gaps, and in the design of guidelines for further studies. The aim of this study was to analyze the scientific production on biopsychosocial risk factors leading to suicide in childhood and adolescents using graph theory.

Method

This study used a scientometric analysis method of the most relevant research productions on suicidal behavior and risk factors present in the child and adolescent population. The procedure is comparable to that reported by Valencia et al. (2020) and Robledo et al. (2023) used for the quantitative and qualitative analysis of literature through graph citation networks with graph theory.

Scientometrics is a discipline that is responsible for studying scientific production based on the analysis of the metadata of scientific publications with different bibliometric methods (Zupic & Čater, 2015). Bibliometric methods focus on analyzing the number of publications, citations and collaboration networks of authors, journals, countries, and organizations, to determine their productivity, impact, and influence in a field of knowledge (Duque & Díaz, 2024; Hirsch, 2005). Other studies use graphical analysis of citation and authorship networks of scientific production to understand an area of knowledge based on its evolution and main research trends (Duque & Díaz, 2024; Valencia et al., 2020). The different procedures used are described below.

Step 1: Search equation and scientometric-bibliometric analysis

The search was carried out in December 2022 using the indexed databases Scopus (Elsevier) and Web of Science (WoS). The keywords used were “suicide” (title) AND “suicidal risk” (topic) AND “children OR teenager” (topic). The search was carried out by title and topic (includes title, abstract and keywords) and in English. The Boolean operators AND and OR were used. Scopus and WoS are the main databases of scientific literature worldwide. Both platforms index millions of journal articles, books, and conference proceedings from different areas of knowledge (Duque & Díaz, 2024; Prancutė, 2021).

A total of 2,058 articles were found, 1,417 in Scopus and 641 in Web of Science. Because graph theory is used for subsequent analyses, it was not necessary to add additional terms or add filters to the search equation (see step 2). The Bibliometrix R package (Aria & Cuccurullo, 2017) was used to analyze the trajectory of the publications, the *H index* and the citations received from the most productive journals and authors. It was also used to analyze the conceptual structure of the publications and the citation networks between authors.

Step 2: Construction and visualization of the graphical citation network

With the purpose of examining research trends on suicidal behavior in children and adolescents, a citation analysis was carried out using graph theory. This perspective allows the creation of a graphic network of citations from the selected records and the references used in each record on the topic of study, which may be prior to the search time frame and appear in other databases. This procedure reduces selection biases related to the search time frame and facilitates the classification of the most

relevant literature using scientometric algorithms and indicators (Robledo et al., 2023; Valencia et al., 2020).

These analyzes are widely used in current psychological literature (Arbeláez et al., 2023; Landínez et al., 2021; Landínez et al., 2022), since they guide research reducing the selection and classification biases of the relevance and impact of the abundant bibliographic records. The Sci2 tool (Sci2 Team. 2009) and Gephi (Bastian et al., 2009) software were used to transform the notes and the list of references into a graphic network of citations.

A selection of citations referenced was made in all the manuscripts of the search pattern to organize the data. Then, articles with a similarity greater than 95 % were identified through the Jaro-Wikker algorithm (Jaro, 1989), therefore, duplicate records were eliminated. The network was updated by merging nodes and removing records with a single citation or with no citations. Finally, disconnected articles were removed from the giant component and the clustering algorithm installed by Blondel et al. (2008), used to design the final network in gephi (Bastian et al., 2009). The final citation network consists of 2,905 nodes (records) and 9,966 edges (citations) and reflects the different research trends from the clustering algorithm (see Figure 3). The main clusters that represent the research trends were selected by applying the inflection point approach to identify the fluctuation in the distribution of nodes within the network (Hurtado-Marín, 2021; Robledo et al., 2023). Lastly the four largest clusters of the graph were selected.

Results

Bibliometric Analysis

Figure 1 shows the annual scientific production published in the Scopus and WoS databases related to suicide and suicidal risk in childhood and adolescence between 2001 and 2022. An annual increase was observed in the number of scientific publications between 2001 and 2021: 7.42 % in WoS; and 8.24 % in Scopus. It is highlighted that the production rate per year is exponential and constant in both databases, evidencing an area of consolidated research and continuous scientific production.

Figure 1

Trend of scientific production by year during the period 2001-2022

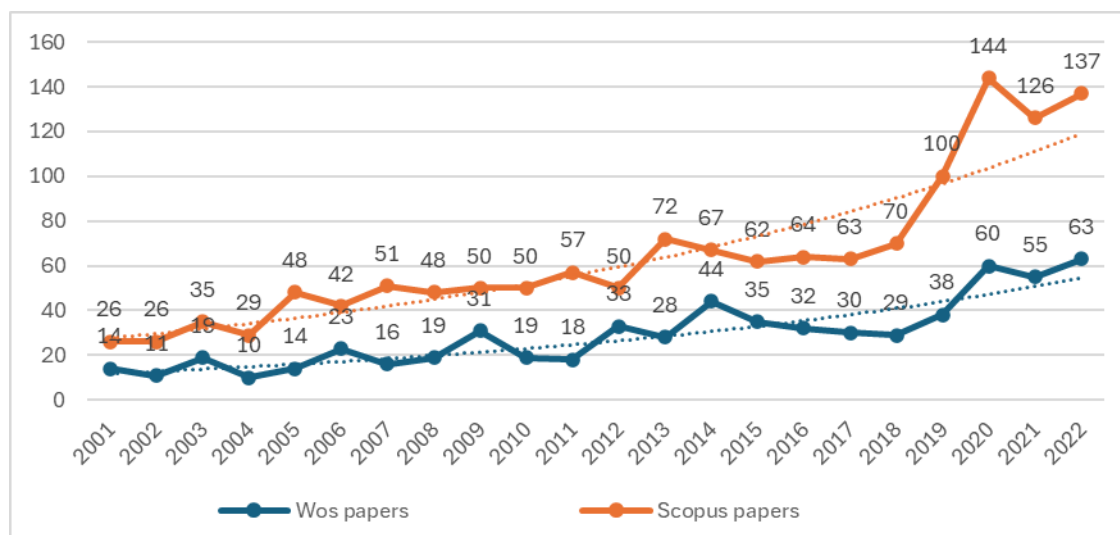


Table 1 presents the ten most recognized indexed scientific journals within the field of study and consulted in the WoS and Scopus databases. It was found that the *Suicide and Life-Threatening Behavior Journal* has the highest number of publications (WoS = 34, Scopus = 75); the *Journal of the American Academy of Child and Adolescent Psychiatry* has the highest number of received citations in WoS ($n = 2,237$); and the *American Journal of Psychiatry* has the highest number of received citations in Scopus ($n = 4,826$). From the results it is highlighted the importance of studying suicide in childhood and adolescence as its scientific production is published in high-impact journals (Q1).

Table 1
Journals with the greatest impact in the field of study

Journal	Web of Science (WoS)			
	Quartile	H	RC	TP
<i>Journal Of the American Academy of Child and Adolescent Psychiatry</i>	Q1	22	2,237	24
<i>Suicide and Life-Threatening Behavior</i>	Q1	21	1,325	34
<i>Journal of Affective Disorders</i>	Q1	13	762	25
<i>Psychiatry Research</i>	Q1	10	443	14
<i>American Journal of Psychiatry</i>	Q1	8	1,807	8
<i>Archives of General Psychiatry</i>	Q1	7	1,133	7
<i>Archives of Suicide Research</i>	Q1	7	239	11
<i>Depression and Anxiety</i>	Q1	7	299	7
<i>Acta Psychiatrica Scandinavica</i>	Q1	6	481	6
<i>Journal of Child Psychology and Psychiatry</i>	Q1	6	1,149	9
Journal	Scopus			
	Quartile	H	RC	TP
<i>Suicide and Life-Threatening Behavior</i>	Q1	34	2,694	75
<i>Journal of Affective Disorders</i>	Q1	26	2,201	70
<i>Journal of the American Academy of Child and Adolescent Psychiatry</i>	Q1	23	2,687	38
<i>American Journal of Psychiatry</i>	Q1	16	4,826	17
<i>Journal of Adolescent Health</i>	Q1	15	1,245	17
<i>Psychiatry Research</i>	Q2	14	693	32
<i>Archives of Suicide Research</i>	Q1	13	1,720	31
<i>Crisis</i>	Q1	13	700	25
<i>Pediatrics</i>	Q1	13	1,051	15
<i>International Journal of Environmental Research and Public Health</i>	Q1	10	260	28

Notes. H: index H; RC: received citations; TP: total publications

Table 2 presents authors with the greatest number of publications, received citations and *H index* related to scientific production on suicidal behavior and vulnerability factors in childhood and adolescence. According to the results, David A. Brent leads scientific production in both WoS and Scopus, with a total of 39 articles in these databases. Also, he is one of the authors with the highest number of citations.

Table 2

Most influential authors in the field of suicide in childhood and adolescence

Web of Science (WoS)				Scopus			
Author	H	RC	TP	Author	H	RC	TP
Brent, D. A.	16	2,678	19	Brent, D. A.	16	5,638	20
Bridge, J. A.	13	2,641	18	Bridge, J. A.	16	3,019	29
Mann, J. J.	11	1,745	12	Roy, A.	15	1,157	16
King, C. A.	9	227	9	Mann, J. J.	14	4,044	19
Shaffer, D.	9	1,048	9	Stanley, B.	13	3,849	14
Stanley, B.	9	1,715	9	Wilcox, H. C.	12	894	17
Wilcox, H. C.	9	452	11	Gunnell, D.	11	704	16
Spirito, A.	8	374	9	Horowitz, L. M.	11	575	17
Birmaher, B.	7	1,440	8	Pao, M.	11	507	16
Hawton, K.	7	204	7	Turecki, G.	11	799	18
Horowitz, L. M.	7	427	9	Oquendo, M. A.	10	3,245	11
Pao, M.	7	378	8	Wasserman, D.	10	577	10
Czyz, E. K.	6	145	6	Birmaher, B.	9	1,824	10
Gunnell, D.	6	283	7	Beautrais, A. L.	8	684	8
Oquendo, M. A.	6	1,002	7	Carli, V.	8	676	8
Turecki, G.	6	431	6	Hawton, K.	8	227	8
Zelazny, J.	6	741	6	King, C. A.	8	396	10
Heron, J.	5	330	6	Nock, M. K.	8	760	9
Nock, M. K.	5	392	5	Shaffer, D.	8	981	8
Gould, M.	4	990	4	Ballard, E. D.	7	169	8

Notes. H: index H; RC: received citations; TP: total publications

Additionally, an analysis of the intellectual and conceptual structure was carried out. Figure 2 shows this analysis that reflects the collaboration network of the twenty most cited authors and the twenty most used keywords in scientific publications.

Figure 2
Conceptual and intellectual structure of scientific publications

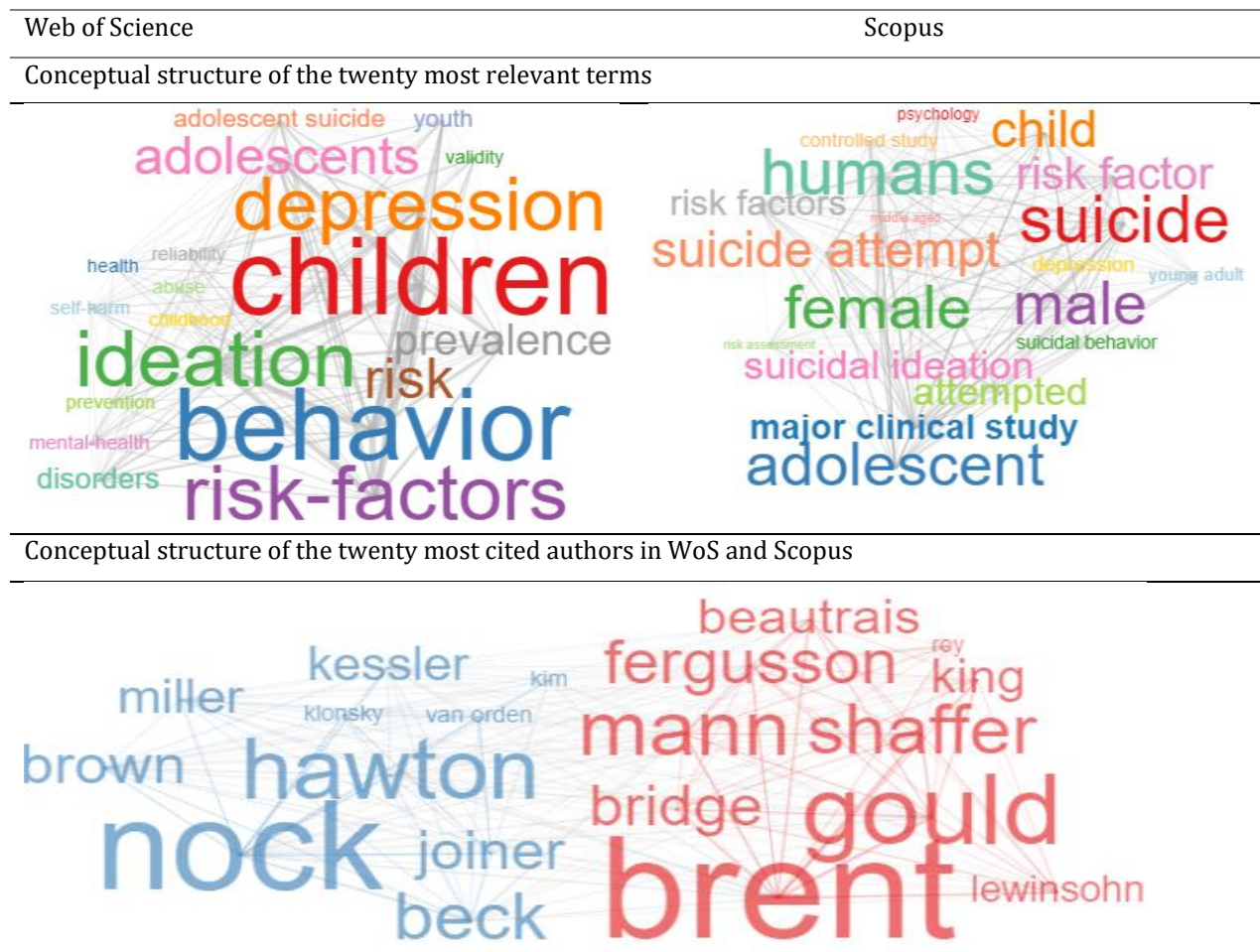
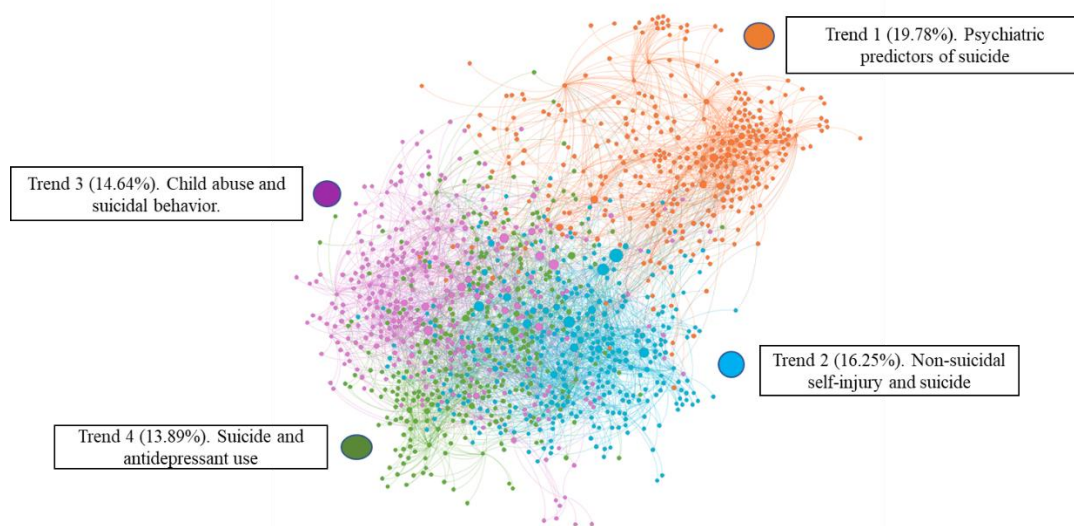


Figure 3 shows the dominant clusters of the final network. Four main clusters were identified as the representing research trends. These clusters show the behavior of knowledge production in each of the perspectives found. Cluster 1 represents 19.78 % of the network and is aimed at studies on clinical predictors of suicidal behavior, including suicide ideation and attempts in childhood and adolescence, as well as psychiatric problems (depression and anxiety). Cluster 2 represents 16.25 % and groups studies on nonsuicidal self-injury and its relationship with suicidal behavior. Nonsuicidal self-injury refers to self-destructive behaviors that involve self-inflicted physical harm, without the intent to cause death (Mars et al., 2019). In contrast, suicidal behavior involves thoughts, fantasies, and desires for death until attempted and completed suicide (Stewart et al., 2017). Cluster 3 represent the 14.64 % of the citations showing the relationship between child abuse and suicidal behavior. Finally, Cluster 4 corresponds to the relationship between suicidal behavior and the use of antidepressants in infants and adolescents, made up by the 13.89 % of the citation network. In the last cluster, a significant relationship was found between the use of selective serotonin reuptake inhibitors (SSRIs) and increased suicidal ideation and risk (Figure 3).

Figure 3
Final network of citations and clustering on suicide and suicidal risk in childhood and adolescence



Discussion

The purpose of this study with a scientometric approach was to analyze the scientific production on risk factors leading to suicide in children and adolescents implementing graph theory. The analyzes implemented made it possible to identify the development of scientific production, the main current research advances and the variability of biopsychosocial factors related to suicidal behavior.

According to the findings reported in the studies of Cluster 1, the studies consulted indicate the following predictors of suicidal behavior in children and adolescents: a history of suicidal ideation and attempts; and psychiatric problems, such as anxiety and depression. In some studies, it has been found that a depressed mood significantly increases the risk of suicide attempts. This mood may cause impulsive, aggressive, and reckless behaviors, inducing intentional self-injury behaviors (Gómez et al., 2020). The above predictor represents a higher risk in early adolescence (Guo et al., 2023) and may be linked to contextual and social variables associated with difficulties in satisfying needs such as belonging to a social group (Gómez et al., 2022).

Regarding the documented findings, it can be concluded that the early detection of risk factors is the base of the public health intervention, which implies the design, the application, and the evaluation of prevention programs in educational institutions. These programs need to have a contextual and an intercultural approach, especially focused on the articulation of intervention components (Núñez et al., 2006) with the purpose of recognizing sociodemographic, psychosocial, and clinical factors leading to suicidal behavior in children and adolescence (Guo et al., 2023; Villarreal-Otálora et al., 2023).

With reference to Cluster 2, it was found that the intentionality of the autolytic act represents a key difference between non-suicidal self-injury (NSSI) and suicidal behavior (SB). NSSI arises with the intention of reducing emotional distress related to anxiety, guilt, anger, and sadness; while SB has a greater tendency to end one's life (Chartrand et al., 2015). Both cases are forms of self-inflicted harm and NSSI has been proposed as a predictive factor for suicide attempt (Mars et al., 2019). However, the variables that contribute to the transition from NSSI to SB are not fully established, nor are the limits that exist between both types of behaviors (Chartrand et al., 2015). The above makes the classifications of these behaviors difficult to understand and may lead to unwanted and costly outcomes in clinical settings such as emotional crises, hospitalization, and in extreme cases, death.

The main factors associated with NSSI and SB are divided into six categories: 1. Emotional: anxiety, affect dysregulation, and depressive symptoms; 2. Cognitive: hopelessness thoughts, and deficits in verbal skills; 3. Behavioral: impulsivity and psychoactive substances abuse; 4. Social: difficulties in facial emotion recognition, social cognition deficits, problems in interpersonal communication, and poor social and conflict resolution skills; 5. Family: separated parents, criminal history of the parents, aggressive and dysfunctional family environments, death of one of the parents, domestic violence; 6. Background: physical and sexual abuse (Afifi et al., 2014; Biscond et al., 2023; Edwards et al., 2022; Gómez et al., 2020; Liu et al., 2023).

Thoughts directed toward suicide and death have significant implications when explaining the relationship between implicit identification with death and negative cognitions in predicting suicide attempts and NSSI in adolescents (Gómez et al., 2020). Likewise, cognitive risk factors with negative valence constitute one of the most relevant components in the diathesis model-stress on self-injury thoughts and behaviors (Wu et al., 2022), in the interpersonal-psychological theory of suicide (Joiner, 2005), and in the cognitive model of suicide behavior (Wenzel & Beck, 2008).

These findings have important implications, both for the development of future studies and for the evaluation of suicidal risk in the clinical context, especially to account for the association between implicit identification with death and negative thoughts that predict NSSI and SB in adolescents. However, these connections have not been sufficiently investigated in an empirical way (Cha et al., 2018). The results regarding the role of negative attributions and stressful events to explain NSSI are another fundamental aspect to highlight from the analysis of the reviewed studies. Given that the vulnerability cognitive variables interact with contextual risk factors, these are an additional aspect to the diathesis-stress model (Abela & Sullivan, 2003; Cha et al., 2018; Wenzel & Beck, 2008).

According to Cluster 3 results, it is possible to establish the relationship between child abuse and suicidal behavior. In line with the above, it has been reported that child abuse is a predictive factor of suicidal behavior, mental disorders, and interpersonal aggression (Gómez et al., 2020; Peng et al., 2022; Soylyu et al., 2022). Gomez et al. (2020), reported that the study of the psychological processes that associate child abuse with suicidal behaviors, the variables that mediate this relationship and the differences in the experiences of childhood abuse and physical abuse have been understood with greater precision given the further analysis used in recently studies. Furthermore, it has been found that exposure to physical abuse at an early age, between 3 and 5 years, significantly increases the probability of developing mood disorders and suicidal ideation (Peng et al., 2022; Siddik et al., 2024; Sun et al., 2024).

About Cluster 4 results, a significant relationship was found between the use of selective serotonin reuptake inhibitors (SSRIs) and the increase of suicidal ideation and risk (Hammad et al., 2006), explaining the connection between suicidal behavior and the use of antidepressants in infants and adolescents. Also, in the United States and some European nations, public health has given alerts about a possible relationship between SSRIs, used in depression treatment, and the suicidal thoughts and behaviors, requiring a labeling change that included a black box warning with regarding the use of SSRIs in all age groups. This “black box” warning promoted the development of studies evidencing there is no direct causal association between SSRIs and new generation antidepressants (NGAs), and the increased risk of self-harming behavior in children and adolescents diagnosed with depression (Cooper et al., 2014; Dudley et al., 2008).

From the above, it can be said that the association between antidepressant prescription rates and suicide rates has been explored in different time frames. The findings have showed that when SSRI has not been prescribing among adolescents in the United States and the Netherlands, following the given warnings, an increased rate in suicidal behaviors was reported when (Gibbons et al., 2007), while the SSRI prescribing was associated with lower suicide rates in childhood and adolescence (Dudley et al., 2008). It should be noted that when SB rates were compared with SSRIs and serotonin-norepinephrine reuptake inhibitors (SNRIs), no statistically significant differences were found (Cooper et al., 2014).

The studies corresponding to the analyzed clusters reported different risk factor that operate as predictors of suicidal behavior. The identified categories were emotional (depression and anxiety); cognitive (suicidal ideation); behavioral (use of antidepressants); and family (history of physical abuse). These predictors remain consistent with what has been documented in previous studies (Coutinho de Mello et al., 2021; Cramm et al., 2023; Dilillo et al., 2015; Gómez et al., 2020; Guo et al., 2023; Kaplan & Szapu, 2019; Zouk et al., 2006).

This study provides systematized knowledge based on the algorithm based on graph theory. The obtain results made possible the identification of the different risk factors and the comorbidity with suicidal behavior. Therefore, the analysis presented may be considered in the evaluation, treatment and clinical follow-up of children and adolescents in antidepressant management processes. Also, these risk factors must be understood in line of emotional, cognitive, family, social and biological aspects involved in suicide risk.

Previous studies have proven the importance of used articulated treatment involving psychoeducation, psychotherapy, and pharmacology for cases of moderate to severe depression, and also constant clinical monitoring (Londoño-Pérez et al., 2022; Moreno Méndez et al., 2023). Even though NGAs may cause undesirable side effects, they are considered effective for depression (Dudley et al., 2008). Thus, the benefit in the pharmacological management of depression outweighs the possible risks, and an adequate mental health monitoring and intervention may prevent self-harming behaviors (Dilillo et al., 2015). However, it is necessary the design of protocols guiding the monitoring processes based on psychoeducation. Furthermore, it is required the training of health professionals to provide adequate management of patients with risk of suicidal ideation and behavior, and specialized treatments of emotions, cognitions, and behaviors leading to mentioned risks (Gibbons et al., 2007).

Finally, it is highlighted that most of the research found used cross-sectional methods, making it necessary to carry out evolutionary follow-up studies in the future. The purpose from the above it to establish a more precisely incidence of the adverse events in childhood mental health, and its impact on suicidal ideation and attempts, as well as examining whether the proximal components identified in the studies consulted mediate or circumvent the association of experiences such as maltreatment, abuse, and childhood adversity with suicidal behavior.

Furthermore, as various early adverse events occurring during childhood and adolescence, that moderate and subsequently predict self-harming behaviors in adulthood, as well as the diversity of biological and psychosocial processes involved in the development of suicidal behavior have not been sufficiently explored, it is essential to evaluate them more precisely.

The findings of the present study deserve to be considered based on the limitations as master's and doctoral theses not consulted, and restricted access sources not considered, which could have contributed to the deepening of the findings about child and adolescent suicide. Future studies should consider these limitations.

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