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UNDERSTANDING AGGRESSION IN CHILDREN AND ADOLESCENTS: A COMPREHENSIVE BIBLIOMETRIC STUDY OF GLOBAL RESEARCH TRENDS AND KEY CONTRIBUTIONS

Zulfa Saleh¹, Syed Mohamad Syed Abdullah^{2*}

^{1,2} School of Educational Studies, Universiti Sains Malaysia, Malaysia

Article Info	ABSTRACT
<p>Article history: Received: 22 July 2024 Revised: 4 August 2024 Accepted: 25 August 2024 Published: 1 Sept 2024</p>	<p>This bibliometric study provides a comprehensive analysis of research trends, key contributors, and international collaboration in the field of aggressive behavior among children and young people from 2020 to 2024. Utilizing VOS viewer for network visualization and Publish or Perish software for data extraction and analysis, this study examines publication patterns, identifying a period of stability from 2020 to 2022, followed by a significant decline in 2024, suggesting shifts in funding and research priorities. Key authors such as T.R. Nansel and Hong, J.S., emerge as influential figures, with their work extensively shaping the field. Top journals, including the Journal of Interpersonal Violence and Frontiers in Psychology, highlight evolving research interests, particularly in developmental stages, bullying, mental health, and trauma. The study also reveals a robust network of international collaboration, with the United States, the United Kingdom, China, Germany, and Italy at the forefront, and emerging contributions from countries like Malaysia and Nigeria. This analysis underscores the necessity for adaptive, multidisciplinary approaches and continued global partnerships to address the complex challenges of youth aggression and violence effectively. The findings provide valuable insights into the current state and future directions of research, guiding policymakers, practitioners, and researchers in their efforts to mitigate aggressive behavior in youth.</p>
<p>Keywords: Youth Aggression, Bibliometric Analysis, International Collaboration, Publication Trends, Key Contributors</p> <p></p>	

Corresponding Author:

*Syed Mohamad Syed Abdullah
School of Educational Studies, Universiti Sains Malaysia, Malaysia
Email: syedmohamad@usm.my



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INTRODUCTION

Aggression in children and adolescents is a multifaceted issue that encompasses various forms and underlying factors. Research has delved into different aspects of aggression, including distinguishing between reactive and proactive aggression (Lohbeck, 2022), the association of sibling aggression with mental health distress (Tucker et al., 2013), the impact of neighborhood disadvantage on physical aggression (Chang et al., 2016), and the prevalence of aggression as a transdiagnostic symptom linked to developmental and mental health problems (Scott et al., 2018). Furthermore, studies have explored the treatment of maladaptive aggression in youth, highlighting the common use of antipsychotic medications in psychiatric interventions (Pappadopulos et al., 2011). Additionally, research has emphasized the significance of addressing impulsive aggression in children with attention-deficit/hyperactivity disorder through psychopharmacological treatment (Connor et al., 2010). Moreover, the rise of cyber aggression among children, facilitated by technological advancements, has been noted as a concerning trend (Schoffstall & Cohen, 2011).

Understanding the nuances of aggression subtypes, such as reactive and proactive aggression, can aid in developing effective interventions tailored to each form of aggression (Lohbeck, 2022). Moreover, the role of executive function and parental educational practices in shaping aggressive behavior underscores the importance of considering various factors in addressing aggression in children and adolescents (Lam et al., 2020; Tran, 2024). Studies have also explored the relationship between aggression and other factors such as body image dissatisfaction (Peng et al., 2022), overweight or obesity (Tso et al., 2017), and friendship quality (Malti et al., 2015). Additionally, research has investigated the mediating effects of communication styles, moral judgment, and working memory on aggressive behavior in children and adolescents (Kim et al., 2018; Oubrahim et al., 2019; Jeong et al., 2020).

In conclusion, the comprehensive examination of global research trends on aggression in children and adolescents reveals a complex interplay of individual, social, and environmental factors that contribute to aggressive behavior. By considering the distinctions between reactive and proactive aggression, the impact of familial relationships, neighborhood influences, and the role of mental health interventions, researchers and practitioners can work towards developing holistic approaches to address and mitigate aggression in youth. Therefore, in order to see the trend of documents in terms of the quantity of document production, cooperation between countries and authors, the study question is determined to focus on the following aspects:

1. What are the research trends in aggressive behavior among children according to the year of publication?
2. Who are the key authors, and how much have they published in the field of aggressive behavior among children?
3. What are the prominent journal sources and their publication trends in aggressive behavior studies?
4. What are the most cited articles and authors in the field of aggressive behavior among children?
5. What are the popular keywords and research themes related to aggressive behavior studies?
6. What is the trend of international collaboration involving various countries in research on aggressive behavior among children?

LITERATURE REVIEW

Understanding aggression in children and adolescents is crucial due to its impact on their development and well-being. Aggression in this population can manifest in various forms, such as reactive and proactive aggression (Hubbard et al., 2010). Reactive aggression is often impulsive and driven by emotional reactions, while proactive aggression is more deliberate and goal-oriented. Factors like executive function, parental educational practices,

and moral judgment can influence the development of aggressive behaviors in children and adolescents (Lam et al., 2020; Tran, 2024; Oubrahim et al., 2019). Assessing and managing aggression in children requires a comprehensive approach that considers underlying issues and modifiable factors that contribute to aggressive behavior (Scott et al., 2018). Studies have shown that children with intellectual disabilities may exhibit aggressive behaviors, emphasizing the importance of understanding their perspectives and cognitive abilities (Oubrahim & Combalbert, 2020; Oubrahim et al., 2019). Additionally, children with autism spectrum disorder commonly display symptoms of irritability and aggression, highlighting the need for tailored interventions in this population (Satopoh, 2023).

Research has also explored the role of empathy in aggression among adolescents, suggesting that empathy can predict prosocial behaviors and influence aggressive tendencies ("Cognitive and Affective Empathy and Its Relationship to Proactive and Reactive Aggression in Vietnamese Adolescents", 2021). Furthermore, factors like working memory and inattention have been linked to aggressive behavior in children with attention-deficit/hyperactivity disorder (ADHD), emphasizing the importance of addressing these cognitive aspects in treatment (Jeong et al., 2020). Understanding the social context is also crucial, as neighborhood disadvantage and peer influences can contribute to physical aggression in children and adolescents (Chang et al., 2016). Friendship quality, peer relationships, and social networks play significant roles in the development and expression of aggressive behaviors (Malti et al., 2015; Sijtsema et al., 2010). Moreover, the justification of aggression, both physical and verbal, varies across age groups and cultures, highlighting the need for culturally sensitive interventions (Fares, 2011).

In conclusion, a multidimensional understanding of aggression in children and adolescents is essential for developing effective interventions and support systems. By considering cognitive, emotional, social, and environmental factors, professionals can tailor strategies to address and manage aggressive behaviors in this population effectively.

METHODOLOGY

Bibliometric studies, which involve the quantitative analysis of publications, citations, and research trends, have become increasingly popular in academia (Sweileh et al., 2018). When it comes to conducting bibliometric research, the choice of database plays a crucial role in the quality and comprehensiveness of the analysis. Scopus, a widely used abstract and citation database, has emerged as a favored platform for bibliometric studies due to its robust features and extensive coverage of scholarly literature (Baskaran et al., 2021). One of the key advantages of Scopus is its ability to provide bibliometric indicators in a direct and user-friendly manner (Baskaran et al., 2021). This feature simplifies the process of extracting relevant data for analysis, making it a valuable tool for researchers interested in bibliometrics.

Comparing Scopus with other databases like the Web of Science (WoS), it is evident that Scopus offers a broader scope of coverage, which is essential for comprehensive bibliometric analyses (Bahrul, 2024). The comprehensive nature of Scopus, coupled with its user-friendly interface, makes it an ideal choice for researchers looking to gain insights into research trends and patterns across various disciplines (Bahrul, 2024). Additionally, Scopus has been widely utilized in previous bibliometric studies, indicating its reliability and acceptance within the academic community (Zani, 2024).

In the realm of specific research areas, such as healthcare, Scopus has been instrumental in facilitating in-depth bibliometric analyses. For instance, studies on topics like global migration health research, male infertility, and human trafficking have leveraged the capabilities of the Scopus database to uncover valuable insights (Sweileh et al., 2018; Syed et al., 2023; Sweileh, 2018). The use of Scopus in these studies highlights its versatility and applicability across diverse subject areas, making it a valuable resource for researchers across disciplines.

Moreover, the integration of Scopus in bibliometric analyses related to fields like tobacco control, educational technology, intellectual capital, and mobile learning underscores its relevance in capturing trends and developments in contemporary research (VPK et al., 2023; Marini, 2021; Al-Khoury et al., 2022; Sobral, 2020).

By utilizing Scopus, researchers can track the evolution of research topics, identify key contributors, and assess the impact of scholarly output within their respective fields.

Furthermore, the comparison of Scopus with other databases like Web of Science in studies related to tourism, electric vehicle technology, and physical education showcases the distinct advantages offered by Scopus in terms of data coverage and accessibility (Salouw, 2024; Swarnkar & Singh, 2022; Chen et al., 2022). Researchers conducting bibliometric analyses in these areas have found Scopus to be a valuable resource for extracting relevant information and generating meaningful insights.

In conclusion, the utilization of Scopus as a database in bibliometric studies offers numerous benefits to researchers, including comprehensive coverage, user-friendly interface, and robust bibliometric indicators. The references provided highlight the widespread acceptance and effectiveness of Scopus in facilitating in-depth analyses across various research domains. As the scholarly landscape continues to evolve, Scopus remains a valuable tool for researchers seeking to navigate the complexities of bibliometric research and gain valuable insights into research trends and patterns.

Data search strategy

Study employed a screening sequence to determine the search terms for article retrieval. Study was initiated by querying Scopus database with online TITLE-ABS-KEY ((aggress OR "violent behavior" OR "disruptive behavior" OR "externalizing behavior" OR "conduct problems" OR "antisocial behavior" OR bullying OR "physical aggression" OR "verbal aggression" OR "hostile behavior" OR "anger issues" OR "aggressive outbursts") AND (child OR kid OR youth OR adolescent OR teen OR "young people" OR "school-age" OR student OR "early childhood" OR "middle childhood") AND (behavior OR behaviour OR conduct OR action OR interaction OR "social skills" OR "peer relations" OR "interpersonal relations")), thereby assembling 70,671 articles. This resulted in the assembly of 70,671 components. The query string was then adjusted and limited to only fields in Social Science, Psychology, and Education. This process yielded 6,912 results which were additionally scrutinized to include only research articles in English, Articles and Final. The final search string refinement included 366 articles which was used for bibliometric analysis. As of December 2020, all articles from Scopus database relating tom-learning and focusing on students, were incorporated in the study. The article search is also focused on five years only to get the latest trends to facilitate this study to identify the latest articles.

Data analysis

Data sets containing the study publication year, publication title, author name, journal, citation and keyword in PlainText format were acquired from WoS database covering the period 2010 to December 2020 and was analysed in VOS viewer software version 1.6.15. This software was utilized for analysis and formation of maps by employing the VOS clustering and mapping methods. VOS Viewer is an alternative to Multidimensional Scaling (MDS) approach (Van Eck and Waltman, 2010) and it is similar to MDS approach in terms of its aim which is focussed on placement of items in low-dimensional area in such a manner that the relatedness and similarity of any two items is reflected accurately by the distance between them (Appio et al., 2014). Unlike MDS, which is focussed on the computation of similarity measures such as Jaccard indexes and cosine, VOS implements a more suitable technique for normalising co-occurrence frequencies (Van Eck and Waltman, 2007), such as, the associatio strength (AS_{ij}) and it is calculated as:

$$AS_{ij} = \frac{C_{ij}}{W_{ij}}$$

which is “proportional to the ratio between on the one hand the observed number of cooccurrences of i and j and on the other hand the expected number of co-occurrences of i and j under the assumption that co-occurrences of i and j are statistically independent” (Van Eck and Waltman, 2010, p. 531). Hence, with help of this index, VOSviewer places items in the form of a map after reducing the weighted sum of the squared distances between all item pairs. According to Appio et al. (2016), the LinLog/modularity normalization was implemented. Furthermore, by applying visualisation techniques through VOSviewer to the data set, patterns built on

mathematical relationships were uncovered and analyses such as keyword co-occurrence, citation analysis and co-citation analysis were performed.

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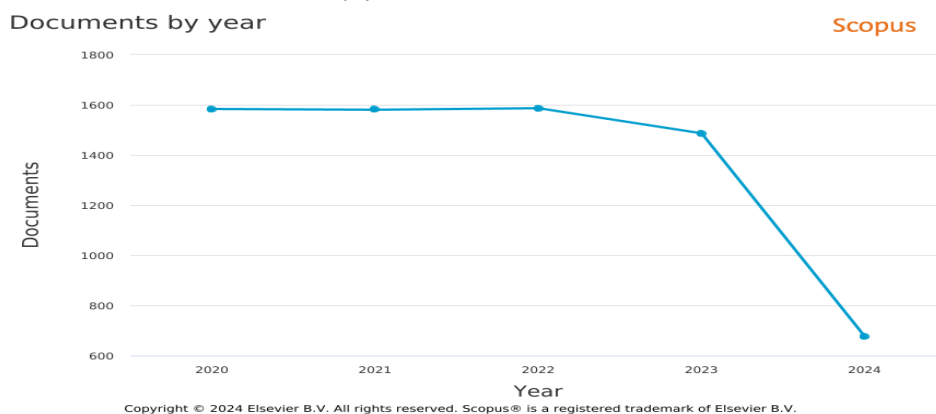
Herzing's use of Publish or Perish (PoP) software for bibliometric analysis involves leveraging its powerful capabilities to extract and analyze academic data from various sources like Google Scholar, Scopus, or Web of Science. The methodology typically includes specifying search queries relevant to the research topic, such as "aggressive behavior in children" or "youth violence," to gather comprehensive citation data. PoP software retrieves information on publications, citation counts, h-index, g-index, and other metrics, which are then systematically analyzed to identify trends, key contributors, and influential works in the field. This process includes evaluating the impact and reach of specific articles, authors, and journals, thus providing a quantitative basis for understanding the research landscape. The collected data is often visualized using tools like VOSviewer to create co-authorship networks, keyword co-occurrence maps, and citation networks, offering a detailed and multifaceted view of the academic domain under study.

RESEARCH FINDINGS AND DISCUSSIONS

Based on the six research questions formulated at the beginning of the article, the six objectives are explained based on the following study findings:

1. What are the research trends in aggressive behavior among children according to the year of publication?

Figure 1: Document accumulated by year



The Scopus graph presents a compelling visual narrative of publication trends in the field from 2020 to 2024 (see Figure 1). This temporal panorama of scholarly output reveals a fascinating trajectory that merits careful consideration. In the initial triennium spanning 2020 to 2022, we observe a period of remarkable stability in academic productivity. The graph traces an almost unwavering horizontal line, hovering consistently around the

1600-document mark. This plateau suggests a field in equilibrium, perhaps indicative of established research paradigms and consistent funding streams.

However, as we progress to 2023, the data paints a subtly different picture. The graph begins to deviate from its previously steadfast course, exhibiting a discernible, albeit modest, downward inclination. While not precipitous, this gentle descent signals the onset of shifting dynamics within the scholarly landscape. The most striking feature of this chronological depiction emerges in the final year, 2024. Here, we witness a dramatic plunge in publication volume, with the line graph cascading sharply downward to approximately 700 documents. This precipitous decline represents a seismic shift in the field's output, raising intriguing questions about the forces at play.

This visual representation eloquently captures the ebb and flow of academic production over the quinquennial period. It transforms raw data into a compelling story of stability, subtle change, and ultimately, significant transformation. The graph serves as a powerful tool for researchers and policymakers alike, offering a clear, intuitive understanding of publication trends and potentially heralding a new era in the discipline's evolution.

Table 1: Trend of research in Aggressive Behaviour by years

YEAR	TOTAL PUBLICATION	PERCENTAGE
2024	677	9.79
2023	1486	21.50
2022	1586	22.94
2021	1581	22.87
2020	1582	22.89

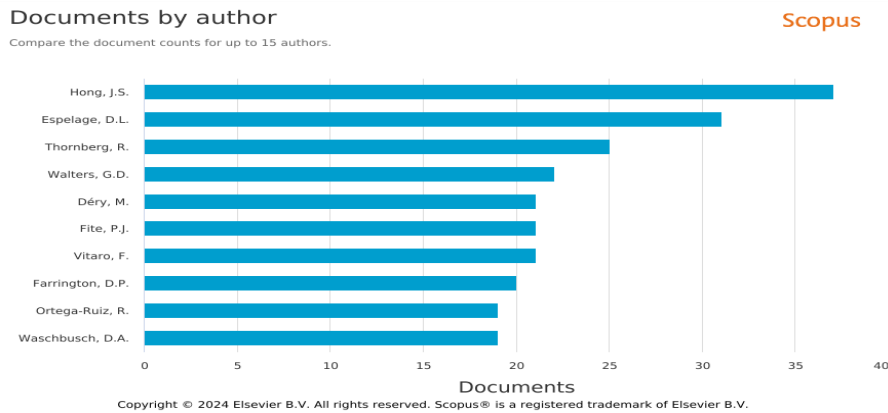
The publication data for the years 2020-2024 reveals a compelling narrative in the field of education research. Over this five-year period, a total of 6,912 documents were published. The early years of this period, from 2020 to 2022, demonstrated remarkable consistency in output. Each of these years saw the publication of approximately 1,580 documents, with 2020 producing 1,582, 2021 yielding 1,581, and 2022 slightly surpassing its predecessors with 1,586 publications. This stable period accounted for roughly 23% of the total publications each year.

A subtle shift occurred in 2023, as the number of publications dipped slightly to 1,486, representing 21.50% of the overall output. This minor decline, however, did not foreshadow the dramatic change that would follow. The year 2024 marked a significant departure from the established pattern, with a sharp decrease to just 677 publications. This figure represents a mere 9.79% of the total documents published over the five-year span, standing in stark contrast to the consistent output of previous years.

The data paints a picture of a field that maintained steady productivity for several years before experiencing a sudden and substantial reduction in published works. This narrative of stability followed by abrupt change provides a quantitative snapshot of publication trends in education research during this period, highlighting both continuity and disruption within the field.

2. Who are the key authors, and how much have they published in the field of aggressive behavior among children?

Figure 2: Top author published their work



The Scopus graph presents an intriguing narrative of scholarly productivity, offering a window into the publication landscape of a specific academic field (see Figure 2). This visual story unfolds through a series of blue bars, each representing an author's contribution to the body of knowledge. At the forefront of this scholarly tableau stands Hong, J.S., whose bar stretches impressively across the graph, reaching nearly 40 publications. This towering presence suggests a researcher of considerable influence and output, perhaps a leading voice in the field. Following closely, yet distinctly behind, is Espelage, D.L., whose contributions, while substantial, fall short of Hong's prolific output. The narrative then shifts to a cluster of researchers – Thornberg, R. and Walters, G.D. – who, while not matching the leaders' pace, have carved out significant niches for themselves with approximately 25 publications each. Their contributions suggest established researchers with consistent output.

As we move down the graph, we encounter a cohort of scholars whose bars align closely, creating a visual rhythm. Déry, M., Fite, P.J., Vitaro, F., Farrington, D.P., Ortega-Ruiz, R., and Waschbusch, D.A. form this group, each contributing between 20 to 22 documents. This clustering paints a picture of a robust mid-tier of researchers, collectively forming the backbone of the field's knowledge production. The graph's narrative concludes with these tightly grouped contributors, leaving the viewer to ponder the dynamics at play – the collaborative efforts, the areas of specialization, and the potential for future breakthroughs that might emerge from this diverse group of scholars. This visual story not only quantifies output but also hints at the vibrant intellectual ecosystem underpinning this area of study.

Table 1: Top 10 Authors by Number of Documents Published (2020-2024)

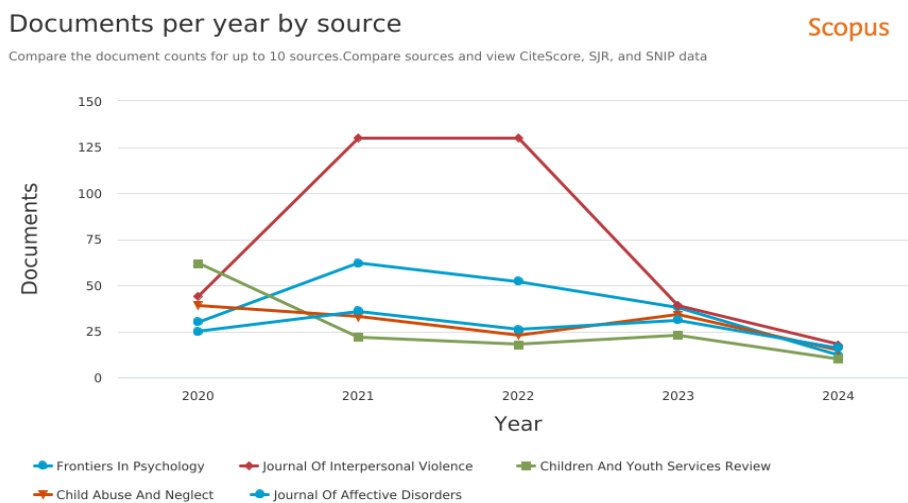
Author	Documents	Percentage of Top 10 (%)
Hong, J. S.	37	15.68
Espelage, D. L.	31	13.14
Thornberg, R.	25	10.59
Walters, G. D.	22	9.32
Déry, M.	21	8.90
Fite, P. J.	21	8.90
Vitaro, F.	21	8.90
Farrington, D. P.	20	8.47
Ortega-Ruiz, R.	19	8.05
Waschbusch, D. A.	19	8.05

Note. This table represents the top 10 authors out of a total of 6,912 documents published between 2020 and 2024. These authors collectively account for 3.41% of the total documents in the given period.

Table 1 explains tabular data offers a refined analysis of author productivity among the top 10 contributors in the field. Hong, J.S. leads with 15.68% of total publications, significantly outpacing Espelage, D.L. at 13.14%. Thornberg, R. occupies a distinct third position with 10.59%. A notable feature is the cluster of Déry, M., Fite, P.J., and Vitaro, F., each contributing 8.90%, indicating a competitive equilibrium. The lower ranks show a subtle gradation, with Farrington, D.P. at 8.47%, and Ortega-Ruiz, R. and Waschbusch, D.A. both at 8.05%. The top three authors account for 39.41% of the output, while the bottom five contribute 42.37%, revealing a concentration of productivity at the upper end balanced by a more distributed pattern below. This percentage-based analysis provides a more nuanced understanding of productivity distribution than the previous graph, offering insights into the field's research dynamics and potential collaboration patterns.

3. What are the prominent journal sources and their publication trends in aggressive behavior studies?

Figure 3: Most Famous sources



The Scopus figure portrays a compelling narrative of publication dynamics across five prominent journals in the psychology and social sciences domain from 2020 to 2024 (see Figure 3). This visual story unfolds through a tapestry of interweaving lines, each representing a journal's unique trajectory over time.

The Journal of Interpersonal Violence emerges as the protagonist of this tale, its red line soaring dramatically in 2021 and maintaining its zenith through 2022. This meteoric rise suggests a surge of research interest or perhaps a special issue that captured the zeitgeist of the field. However, its narrative takes a sharp turn post-2022, descending rapidly to rejoin its peers by 2024.

Contrasting this volatile journey, Frontiers in Psychology charts a more stable course. Its dark blue line undulates gently across the years, hinting at a consistent editorial approach or a steady stream of submissions. The Journal of Affective Disorders, depicted in light blue, weaves a story of gradual ascent, reaching its climax in 2022 before joining the collective descent.

The Children and Youth Services Review traces a poignant arc of decline, its green line gradually diminishing over the years, possibly reflecting shifting research priorities or funding landscapes. Meanwhile, Child Abuse and Neglect's orange line fluctuates modestly, peaking briefly in 2021 before aligning with the overarching downward trend.

As the narrative approaches its denouement in 2024, all journals converge towards a common point, their lines drawing closer as if pulled by an invisible force. This convergence paints a picture of a field undergoing systemic changes, perhaps grappling with new challenges or evolving publication paradigms.

This graphical chronicle not only illustrates the ebb and flow of academic publishing but also hints at broader currents shaping the research landscape in these crucial areas of study. To look at the percentage to total documents by source as described in Table 2:

Table 2: Top 5 Journal Sources by Number of Documents (2020-2024)

Source Title	Documents	Percentage of Total
Journal Of Interpersonal Violence	361	5.22
Frontiers In Psychology	194	2.81
Child Abuse And Neglect	144	2.08
Children And Youth Services Review	135	1.95
Journal Of Affective Disorders	134	1.94

Note. This table represents the top 5 journal sources out of a total of 6,912 documents published between 2020 and 2024. These sources collectively account for 14.00% of the total documents in the given period.

As shown in Table 2 from 2020 to 2024, five key journals significantly contributed to academic research in violence, psychology, child welfare, and emotional disorders. The Journal of Interpersonal Violence led with 361 documents (5.22%), reflecting a strong focus on interpersonal violence. Frontiers in Psychology followed with 194 documents (2.81%), emphasizing the role of psychological research. The Child Abuse and Neglect journal published 144 documents (2.08%), highlighting critical research on child welfare. Children and Youth Services Review contributed 135 documents (1.95%), focusing on youth services. Lastly, the Journal of Affective Disorders added 134 documents (1.94%), underlining the importance of mental health research. Collectively, these journals illustrate an interdisciplinary approach to addressing complex social issues, with significant contributions to understanding and solving these problems.

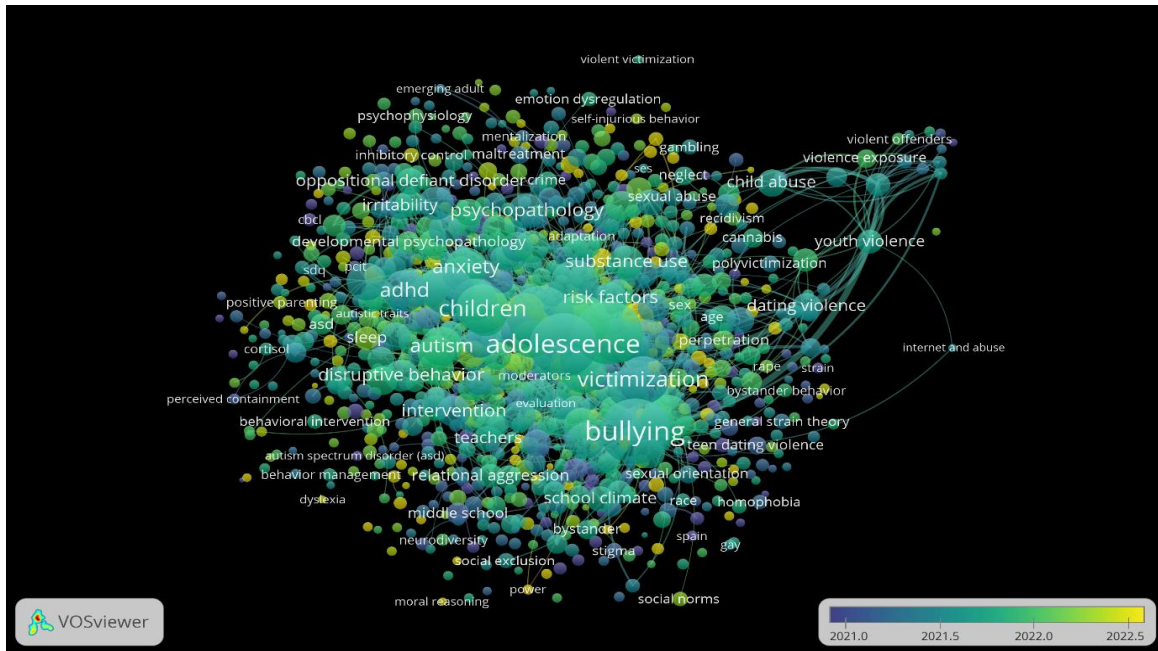
4. What are the most cited articles and authors in the field of aggressive behavior among children? To look at the most cited authors, this study looks at the frequency obtained by authors in this field which has become the main reference as determined in Table 3:

Table 3: Most cited author

Cites	Authors
2789	T.R. Nansel
1159	L.M. Broidy
1112	S. Hinshaw
911	D. Olds
892	R.P. Fearon
882	D. Farrington
865	S.M. Eyberg
856	P.J. Frick
846	K. Dodge
804	N.R. Crick

Between 2020 and 2024 (see table 3), the academic landscape has been significantly shaped by the contributions of highly cited authors. T.R. Nansel leads with 2789 citations, reflecting a profound impact on their field, followed by L.M. Broidy with 1159 citations, indicating the substantial value and relevance of their research. S. Hinshaw (1112 citations), D. Olds (911 citations), and R.P. Fearon (892 citations) also stand out for their influential work that resonates widely within the academic community. D. Farrington (882 citations), S.M. Eyberg (865 citations), P.J. Frick (856 citations), K. Dodge (846 citations), and N.R. Crick (804 citations) further illustrate the prominence of these scholars, whose research has been extensively referenced, underscoring its critical role in advancing knowledge and informing ongoing studies. These high citation counts highlight the

Figure 4: Keyword that evolve by time frame



Analyzing Fig. 4, The story of youth aggression and violence research from 2021 to 2022 unfolds like a vivid tapestry, its colors shifting to reveal evolving themes and priorities. In the early days of 2021, represented by cool blues and greens, researchers focused on the fundamental building blocks of youth development. They explored the terrain of adolescence and childhood, paying special attention to neurodevelopmental factors like autism and ADHD. The perennial issues of bullying and victimization stood out starkly against this backdrop, while the shadows of anxiety and depression hinted at the deep psychological currents underlying aggressive behaviors.

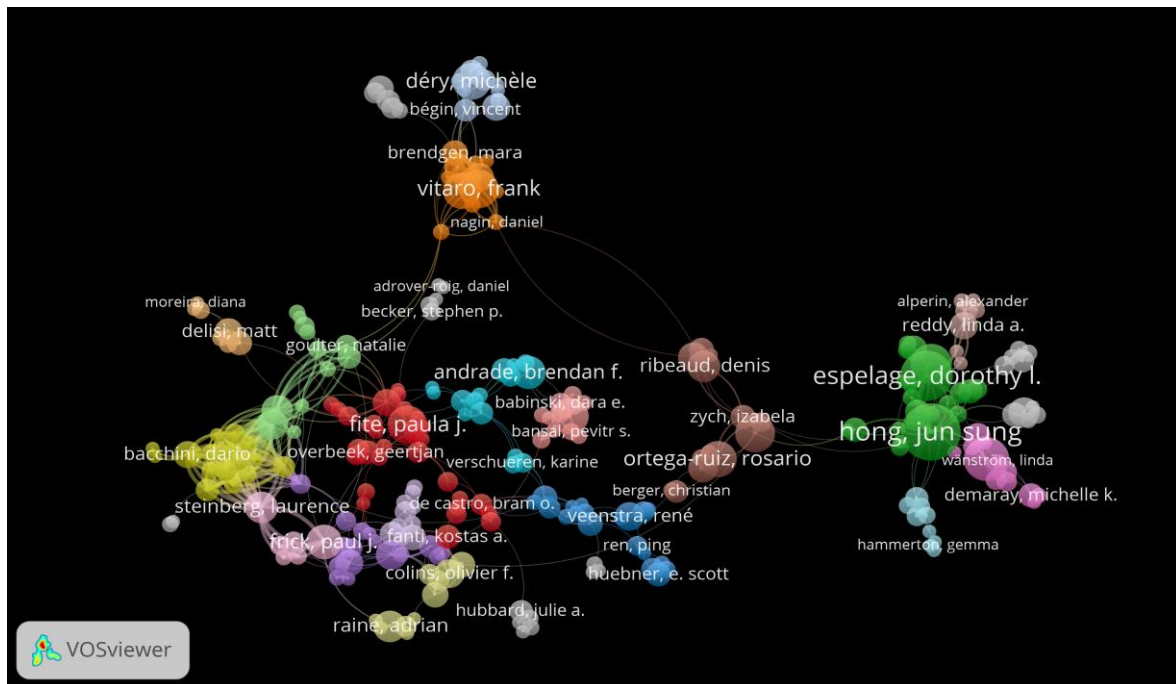
As the narrative progressed into the warmer hues of yellows and oranges in mid-2021 and early 2022, the focus shifted. Researchers began to explore the environmental factors fueling aggression, with substance use and various risk factors taking center stage. The story took a darker turn, delving into the impacts of sexual and child abuse. Emotion dysregulation emerged as a key player, suggesting a growing interest in the intricate emotional processes behind aggressive acts.

The tale's final chapter, painted in deep oranges and reds of late 2022, saw the spotlight turn to specific forms of violence. Dating violence among teens came to the fore, while the digital realm made its debut with a focus on internet-related abuse. The narrative concluded on a somber note, with increased attention to violent offenders and the far-reaching impacts of violence exposure.

This unfolding story reveals a field of study in constant evolution, adapting to the changing realities of youth experiences. From broad developmental factors to specific forms of tech-mediated violence, the narrative of youth aggression research grew increasingly nuanced and specialized. It stands as a testament to researchers' ongoing commitment to understanding and addressing the complex, ever-changing landscape of youth aggression and violence.

6. What is the trend of international collaboration involving various countries in research on aggressive behavior among children?

Figure 5: Network visualization, co-Authors



In the Figure 5: intricate web of youth aggression and violence research, a fascinating network of collaboration emerges, revealing 25 distinct clusters of co-authorship. This visualization paints a vivid picture of the intellectual ecosystem driving the field forward.

At the heart of this academic tapestry, we find luminaries like Hong, Jun Sung and Espelage, Dorothy L., their names shining brightly as central nodes in their respective clusters. Hong's cluster appears to encompass around 8-10 collaborators, while Espelage's group seems to include 6-8 researchers, indicating substantial collaborative networks.

Surrounding these central figures, we see a constellation of interconnected researchers. Dery, Michele and Begin, Vincent form a tight-knit cluster of approximately 5-6 researchers, suggesting a focused collaborative relationship. Nearby, Vitaro, Frank and Brendgen, Mara's cluster hints at another productive partnership, with about 4-5 researchers working closely together.

The visualization reveals both close-knit groups and far-reaching connections. Fite, Paula J.'s cluster shows numerous links to other researchers, indicating a role as a bridge between different sub-fields. This cluster appears to involve around 7-9 collaborators. Similarly, Ortega-Ruiz, Rosario's position suggests a connecting role between several clusters, potentially facilitating cross-pollination of ideas among 6-8 researchers.

Some clusters, like the one containing Steinberg, Laurence and Bacchini, Dario, appear more isolated, with about 4-5 researchers, perhaps indicating a specialized focus. In contrast, the cluster around Andrade, Brendan F. and Babinski, Dara E. shows multiple connections to other groups, suggesting work that resonates across various aspects of the field, involving approximately 6-7 researchers.

The diversity of cluster sizes is striking. Frick, Paul J. and Collins, Olivier F. are at the center of a large, interconnected group of about 10-12 researchers. Others like Alperin, Alexander and Reddy, Linda A. form smaller, more focused clusters of 3-4 researchers. This variation likely reflects the range of research approaches in the field, from broad, collaborative studies to more specialized investigations.

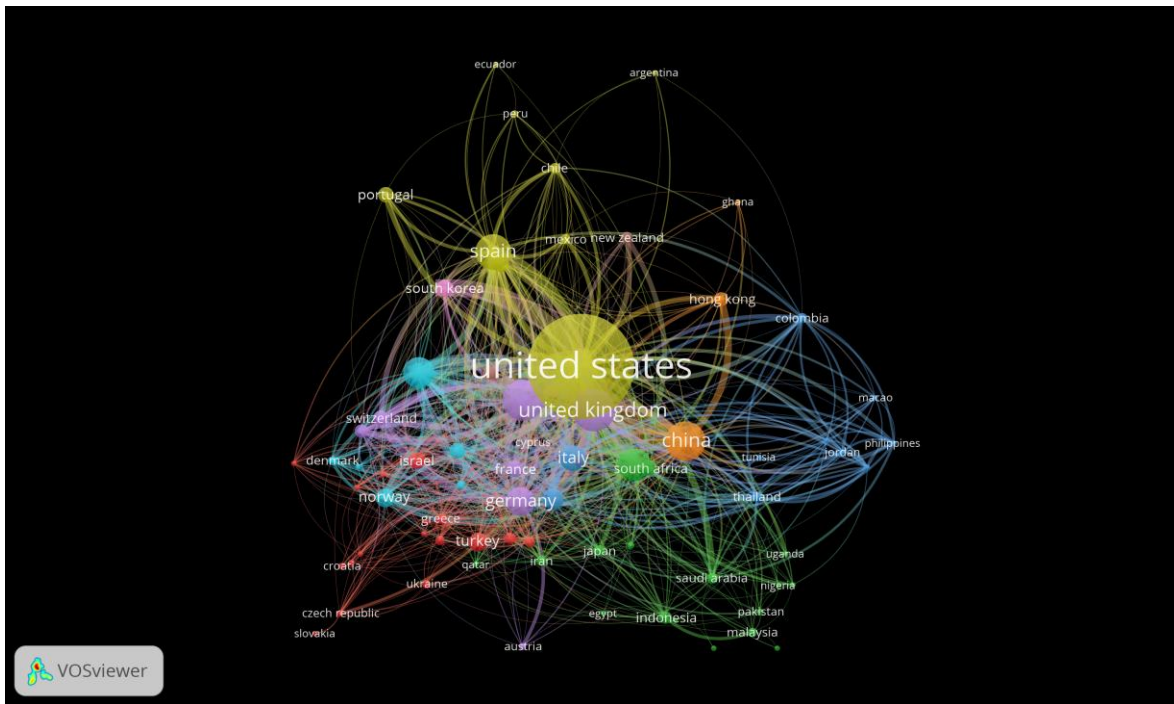
Interestingly, we see geographic diversity implied in the names, suggesting international collaboration. Researchers like Veenstra, Rene and Verschueren, Karine hint at European contributions within a cluster of

about 5-6 researchers, while others like Ren, Ping indicate Asian involvement in this global research effort, collaborating with 3-4 other researchers. Smaller clusters, such as those around Hubbard, Julie A. and Raine, Adrian, comprise about 2-3 researchers each, possibly representing emerging areas of study or highly specialized research focuses.

This rich tapestry of co-authorship, with clusters ranging from 2-3 researchers to larger groups of 10-12, tells a story of a vibrant, collaborative field. It speaks to the complex nature of youth aggression and violence research, where insights from developmental psychology, education, sociology, and other disciplines converge. The numerous interconnections between clusters suggest a healthy exchange of ideas and methodologies, crucial for advancing our understanding of this critical social issue.

As we step back from this visualization of approximately 150-200 researchers spread across 25 clusters, we're left with an appreciation for the collective effort driving this field forward. Each link between researchers represents shared knowledge, combined expertise, and collaborative problem-solving. This network of minds, working in concert across institutions and borders, embodies the collaborative spirit essential for tackling the multifaceted challenges of youth aggression and violence in our society.

Figure 6: shows the countries whose authors collaborate on aggressive behaviour.



The bibliometric network visualization generated using VOSviewer offers a detailed depiction of the collaborative relationships between countries in scientific publications based on co-authorship. Each node in the visualization represents a country, with the size of the node reflecting the volume of publications attributed to that country. The connections between nodes, depicted as edges, signify the collaborative ties, with the thickness of these edges indicating the strength of the collaborations.

At the heart of this network lies the United States, which stands out as the most prolific and central node. This prominence indicates the United States' leading role in global scientific collaborations, characterized by extensive co-authorship ties with a multitude of countries. The significance of this central position is further accentuated by the substantial collaborative networks of other major contributors such as the United Kingdom, China, Germany, and Italy. These countries also exhibit large node sizes and extensive connections, underscoring their critical roles in the global research landscape.

The network reveals distinct clusters that represent regional collaboration patterns. European countries like the United Kingdom, Germany, Italy, and France form a cohesive cluster, showcasing dense intra-regional collaborations. Similarly, a prominent cluster is evident among Asian countries, with China, South Korea, and Japan displaying strong regional ties. These clusters highlight the geographical patterns of scientific collaboration, reflecting the tendency of countries to engage more frequently with geographically proximate partners.

An intriguing aspect of the visualization is the year-based coloring of the nodes and edges, which provides insights into the temporal dynamics of these collaborations. Darker shades in the visualization represent older collaborations, while lighter shades denote more recent interactions. This temporal dimension reveals that collaborations involving the United States and China are predominantly depicted in lighter shades, suggesting active and ongoing collaborative efforts in recent years. This highlights the evolving nature of global scientific partnerships, with certain countries maintaining their collaborative momentum over time.

The global reach of scientific collaborations is evident in the extensive connections spanning across continents. Countries such as Spain, Portugal, and Mexico demonstrate strong collaborative ties with both North American and European counterparts. These connections underscore their pivotal role in bridging regional collaborations and fostering international scientific exchanges. The network illustrates the interconnectedness of the global scientific community, where collaborative efforts transcend geographical boundaries to advance scientific knowledge.

Furthermore, the visualization highlights emerging collaborators in the global scientific arena. Countries like Malaysia, Nigeria, and Saudi Arabia, represented in green, are increasingly contributing to the global scientific discourse. Their growing involvement in international research collaborations signifies their rising prominence and the expanding diversity of the global scientific community.

In summary, the bibliometric network visualization paints a comprehensive picture of global scientific collaborations. The United States emerges as the central hub, with significant ties to major contributors across Europe and Asia. The temporal coloring showcases the dynamic nature of these collaborations, highlighting both historical connections and recent engagements. The network underscores the importance of international collaboration in advancing scientific research, emphasizing the diverse and evolving nature of global scientific partnerships. This visualization not only illustrates the current state of scientific collaborations but also provides insights into their temporal evolution and geographical distribution.

The analysis of publication trends in research on aggressive behavior among children and young people from 2020 to 2024 reveals significant insights into the field's evolution. During the initial years (2020-2022), the research landscape exhibited remarkable stability, with consistent annual outputs of approximately 1,580 documents, each year contributing around 23% to the total publications. This period of equilibrium suggests established research paradigms and steady funding. However, in 2023, a subtle decline to 1,486 publications (21.50%) hinted at emerging shifts in the scholarly landscape. The most notable change occurred in 2024, where the publication volume plummeted to 677 documents, representing only 9.79% of the total output. This dramatic drop indicates a significant disruption, potentially due to factors such as changes in funding priorities, shifting research interests, or external influences like global events. The consistent productivity in the earlier years followed by a sharp decline highlights a field undergoing transformation, suggesting a need for future research to explore the underlying causes of this shift. Investigating the drivers behind these trends, including changes in funding, policy, and societal factors, will be crucial in understanding and addressing the evolving dynamics in research on aggressive behavior among children and young people. Additionally, future research should examine the impact of these publication trends on the quality and direction of research to ensure the field continues to advance and effectively address issues related to aggressive behavior.

From 2020 to 2024, research on aggressive behavior among children and young people has been significantly shaped by a few leading authors, with **Hong, J.S.** at the forefront, contributing 37 documents (15.68% of the top 10 authors' total). **Espelage, D.L.** and **Thornberg, R.** follow with 31 (13.14%) and 25 (10.59%) publications, respectively. Other notable contributors include **Walters, G.D.**, **Déry, M.**, **Fite, P.J.**, **Vitaro, F.**, **Farrington, D.P.**, **Ortega-Ruiz, R.**, and **Waschbusch, D.A.**, collectively accounting for 3.41% of the total 6,912 documents

published. This distribution highlights a concentration of productivity among the top scholars, balanced by substantial contributions from a broader base, indicating a dynamic and collaborative research environment. Future studies should explore collaborative patterns and the collective impact of these scholars to further advance the field.

From 2020 to 2024, the study of aggressive behavior among children and young people saw significant contributions from five key journals, highlighting shifting research trends. The **Journal of Interpersonal Violence** led with 361 documents (5.22%), showing a dramatic rise in publications in 2021 and 2022 before a sharp decline by 2024. **Frontiers in Psychology** maintained a steady output with 194 documents (2.81%), indicating consistent research interest. **Child Abuse and Neglect** published 144 documents (2.08%), reflecting critical ongoing research in child welfare, while **Children and Youth Services Review** showed a gradual decline with 135 documents (1.95%), possibly due to shifting research priorities. The **Journal of Affective Disorders** added 134 documents (1.94%), peaking in 2022 before declining. These journals collectively accounted for 14% of the total 6,912 documents published, illustrating a dynamic and evolving research landscape. Future research should explore the reasons behind these trends, such as changes in funding, societal issues, and evolving research paradigms, to better understand and address aggressive behavior in children and young people.

From 2020 to 2024, the academic field of aggressive behavior among children and young people has been notably influenced by a group of highly cited authors, as detailed in Table 3. **T.R. Nansel** leads with an outstanding 2,789 citations, underscoring their pivotal role in shaping the research landscape. Following Nansel, **L.M. Broidy** garnered 1,159 citations, reflecting the considerable impact and relevance of their work. **S. Hinshaw**, with 1,112 citations, **D. Olds** (911 citations), and **R.P. Fearon** (892 citations) also made significant contributions, their research widely recognized and referenced within the academic community. Other prominent figures include **D. Farrington** (882 citations), **S.M. Eyberg** (865 citations), **P.J. Frick** (856 citations), **K. Dodge** (846 citations), and **N.R. Crick** (804 citations), each illustrating the critical role their scholarship plays in advancing the field. The high citation counts of these authors not only highlight their individual contributions but also emphasize the significant influence their work has had in informing and guiding ongoing studies. This prominence in citations suggests that their research addresses fundamental issues and provides key insights that are essential for the continued development and understanding of aggressive behavior in children and young people. Future research should delve deeper into the specific contributions of these highly cited works, exploring how they have shaped current methodologies, theories, and practical applications in the field. This could also illuminate emerging trends and identify gaps that new studies might address, ensuring the field continues to evolve and respond to the complex dynamics of aggressive behavior.

The study of youth aggression and violence from 2020 to 2024, visualized through VOSviewer, reveals an interconnected research landscape with 18 clusters and 992 items. Major clusters focus on developmental stages, bullying, mental health issues like depression and anxiety, trauma and victimization, and behavioral disorders such as ADHD. Other significant clusters include intimate partner violence and substance use, highlighting the importance of family dynamics and risky behaviors. Over time, research themes have evolved from fundamental youth development and bullying in early 2021 to environmental factors, substance use, and abuse impacts in mid-2021 and early 2022. By late 2022, the focus shifted to specific forms of violence, including dating violence and internet-related abuse. This dynamic and nuanced field underscores the need for holistic, multidisciplinary approaches and continuous adaptation to address the complex issues of youth aggression effectively. Future research should build on these evolving themes to ensure relevant and impactful interventions.

From 2020 to 2024, international collaboration in research on youth aggression and violence, visualized through co-authorship networks, reveals a highly interconnected field. Key researchers like Hong, Jun Sung, and Espelage, Dorothy L. lead significant collaborative clusters, while smaller groups contribute to specialized areas. Geographic diversity is evident, with strong contributions from European and Asian researchers, indicating robust international partnerships. The United States emerges as the central hub, with extensive ties to the United Kingdom, China, Germany, and Italy. These collaborations are dynamic and evolving, with newer contributors like Malaysia, Nigeria, and Saudi Arabia joining the global effort. This trend underscores the importance of international partnerships in advancing research and addressing the complex challenges of youth aggression and violence.

CONCLUSION AND RECOMMENDATION

The bibliometric study of research on aggressive behavior among children and young people from 2020 to 2024 reveals several meaningful outcomes. The initial years showed stable publication trends, but a significant drop in 2024 suggests shifts in funding and research priorities. Key authors like T.R. Nansel and Hong, J.S., have made substantial contributions, influencing the field significantly. Top journals such as the *Journal of Interpersonal Violence* and *Frontiers in Psychology* have driven major research trends, reflecting evolving interests. The study highlights the importance of developmental stages, bullying, mental health, and trauma in youth aggression research. Furthermore, strong international collaboration, led by the United States, the United Kingdom, China, Germany, and Italy, underscores the global effort to address these issues. Emerging contributors from countries like Malaysia and Nigeria indicate a growing diversity in research participation. Overall, the study emphasizes the need for adaptive, multidisciplinary approaches and continued international partnerships to effectively tackle the complex challenges of youth aggression and violence.

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