

Early Childhood Physical Aggression and Child Maltreatment: A Bibliometric Analysis of Research Trends, Knowledge Structure and Emerging Themes

Mariam Jardini

University of Casablanca <https://orcid.org/0009-0007-8447-0163>

Yatheesh Bharadwaj

yatheesh428@gmail.com

National Institute of Mental Health and Neurosciences <https://orcid.org/0000-0002-9957-0833>

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Abstract

Highlights

- Bibliometric map of 268 studies on early childhood aggression and maltreatment
- Half of the documents came from the USA; international co-authorship was 5.6%
- Family-level framing of physical aggression formed the field's motor theme
- Parenting, maternal risk and mental health formed weakly connected niche themes
- Inhibitory control, language and intervention were absent from top keywords

1. Introduction

Physical aggression is a normative feature of early human development. Hitting, pushing and biting emerge in most children during the second year of life, typically peak between two and four years of age, and decline thereafter as language, emotion regulation and inhibitory control mature, a developmental course now well documented in longitudinal studies of early childhood behavior (Tremblay, 2000; Tremblay et al., 2004). For a subgroup of children, however, this decline does not occur: physical aggression remains elevated or continues to rise across the preschool years, and this atypical trajectory is among the most robust early markers of later conduct problems, peer rejection and antisocial development. Understanding why some children follow this persistent pathway, while most do not, remains a central question for developmental psychopathology.

Child maltreatment, encompassing physical abuse, emotional abuse, neglect, sexual abuse and exposure to family or domestic violence, is one of the most consistently identified risk factors associated with elevated and persistent physical aggression in young children (Cicchetti & Toth, 2005). Several, only partially overlapping, mechanisms have been proposed to account for this association: disorganized attachment, biased social-information processing, dysregulated stress physiology, and deficits in emotion regulation, inhibitory control and verbal skills that limit a young child's access to nonphysical means of self-expression and conflict resolution. Disruptions in the quality of caregiver–child interaction have also been proposed as both a consequence of maltreatment and a proximal mechanism sustaining aggressive behavior. Taken together, this body of work situates early physical aggression not as an isolated behavioral symptom, but as a developmental outcome embedded in the broader relational and ecological context of the maltreated child.

Despite this shared developmental logic, research on early childhood physical aggression and research on child maltreatment have largely developed as parallel literatures. The former is anchored primarily in developmental and experimental psychology, organized around trajectory models, laboratory and observational paradigms, and constructs such as reactive and proactive aggression. The latter draws more heavily on clinical, social work, intervention and child protection outcomes. Each literature has its

own flagship journals, theoretical vocabulary and preferred methodology, and it remains empirically unclear to what extent, and through which authors, journals and conceptual lenses, these two bodies of work actually intersect around the specific developmental window of early childhood, as opposed to being studied separately or primarily in relation to older children and adults.

Bibliometric analysis offers a way to move from an impressionistic sense of this fragmentation to an empirically grounded map of the field. By combining performance analysis with science mapping, bibliometric methods can characterize not only how much has been published on this intersection, but also how the underlying concepts are organized, which themes dominate the field, which remain peripheral, and how this structure has shifted over time (Donthu et al., 2021; Zupic & Čater, 2015). Bibliometric analyses have already been conducted on child maltreatment broadly (Cebeci, 2026; Tran et al., 2018), on adverse childhood experiences (Sai Sindhura & Ganesh Kumar, 2025; Struck et al., 2021) and on aggression as a general construct (Sun et al., 2023). None of these studies, however, restricts its population to early childhood specifically, and none requires physical aggression and maltreatment to be studied jointly rather than separately. It therefore remains unknown, in bibliometric terms, whether and how strongly these two literatures converge around the developmental period in which their theoretical link is arguably strongest.

The present study addresses this gap through a combined descriptive and science-mapping bibliometric analysis of the literature situated at the intersection of physical aggression and child maltreatment during early childhood (0–6 years, with particular attention to the preschool period). Specifically, this study addresses the following research questions (RQs):

RQ1. How has scientific production on physical aggression and child maltreatment in early childhood evolved over time in terms of volume, growth rate and citation impact?

RQ2. Which authors, institutions, countries and journals are the most productive and most cited contributors structuring this sub-field, and what collaboration patterns characterize them?

RQ3. Which concepts and keywords are most strongly associated with physical aggression and maltreatment during early childhood?

RQ4. Which thematic clusters can be identified from the co-occurrence of keywords, independently of any a priori theoretical categorization?

RQ5. How has the relative prominence of the field's dominant keywords evolved across the study period?

RQ6. Which themes, populations, geographic regions or conceptual links (in particular, the joint treatment of maltreatment and physical aggression, as opposed to each studied separately) appear under-explored, under-connected or absent from the current knowledge structure?

Beyond its descriptive value, this mapping is intended to clarify where existing research converges and where structural gaps remain, thereby providing an empirically grounded basis for situating future

developmental and clinical research on this intersection.

2. Methods

2.1. Design

This study employed a combined descriptive and science-mapping bibliometric design (Donthu et al., 2021; Zupic & Čater, 2015) to characterize the scientific literature situated at the intersection of physical aggression and child maltreatment during early childhood. Descriptive (performance) analysis was used to quantify publication trends, productivity and citation impact, while science mapping was used to characterize the field's thematic structure and its evolution over time.

2.2. Search strategy

The search strategy was built around three conceptual blocks: (a) early childhood (e.g., early childhood, preschool*, toddler*, young child*, kindergarten), (b) physical aggression (e.g., physical aggress*, aggressive behavio*r, reactive/proactive aggression, hitting, kicking, biting) and (c) child maltreatment (e.g., child maltreatment, child abuse, child neglect, physical/emotional abuse, exposure to violence, family/domestic violence, adverse childhood experience*). The three blocks were combined with the Boolean operator AND, and terms within each block were combined with OR. The following search strings were applied:

Web of Science Core Collection:

TS = (("early childhood" OR presch* OR toddler* OR "young child*" OR kindergarten OR "nursery school" OR prekindergarten) AND ("physical aggress*" OR "aggressive behavio*r" OR "reactive aggression" OR "proactive aggression" OR hitting OR kicking OR biting) AND ("child maltreatment" OR "child abuse" OR "child neglect" OR "physical abuse" OR "emotional abuse" OR "exposure to violence" OR "family violence" OR "domestic violence" OR "adverse childhood experience*")); refined by Publication Years (1990–2025) and Document Types (Article, Review).

Scopus:

TITLE-ABS-KEY(("early childhood" OR presch* OR toddler* OR "young child*" OR kindergarten OR "nursery school" OR prekindergarten) AND ("physical aggress*" OR "aggressive behavio*r" OR "reactive aggression" OR "proactive aggression" OR hitting OR kicking OR biting) AND ("child maltreatment" OR "child abuse" OR "child neglect" OR "physical abuse" OR "emotional abuse" OR "exposure to violence" OR "family violence" OR "domestic violence" OR "adverse childhood experience*")) AND PUBYEAR > 1989 AND PUBYEAR < 2026 AND (LIMIT-TO(DOCTYPE, "ar") OR LIMIT-TO(DOCTYPE, "re")).

No language restriction was applied to either database, in order to maximize the sensitivity of the search.

2.3. Eligibility criteria

Only journal articles and reviews published between 1990 and 2025 were eligible for inclusion; this restriction was applied directly at the database query stage. Book chapters, conference papers, editorials, notes and short surveys were excluded because these document types are inconsistently indexed across databases.

2.4. Search execution and data merging

The searches were executed in the Web of Science Core Collection and Scopus, yielding 138 and 191 records, respectively (total $N = 329$), with the document-type filter (article, review) applied directly at the query stage in both databases. Full bibliographic records, including titles, abstracts, keywords and citation counts, were exported and merged into a single dataset. Sixty-one duplicate records were identified and removed, resulting in a final analytic corpus of 268 documents (238 articles and 30 reviews).

2.5. Data analysis

All bibliometric analyses were conducted using the bibliometrix R package and its Biblioshiny web interface (Aria & Cuccurullo, 2017). Performance analysis included annual scientific production, annual growth rate, a nonlinear growth model of cumulative output, citation-based indicators for authors, institutions, countries and journals, Bradford's law of source scattering and Lotka's law of author productivity. Science mapping included keyword co-occurrence analysis, a thematic map based on the centrality–density strategic diagram (Cobo et al., 2011), a conceptual structure map based on multiple correspondence analysis (MCA), and a longitudinal analysis of word frequency and trend topics to characterize the thematic evolution of the field across the study period. Co-citation and bibliographic-coupling analyses were not conducted, as they were judged not to be central to the research questions addressed in this study.

3. Results

3.1. Corpus overview

Table 1 summarizes the main characteristics of the corpus. The 268 documents (238 articles and 30 reviews) were published in 164 sources between 1990 and 2025 by 999 authors, with an annual growth rate of 8.43%. The mean document age was 13.3 years and documents received a mean of 56.31 citations. Only 36 documents were single-authored; documents had a mean of 4.27 co-authors, and 5.60% involved international co-authorship. The corpus contained 1,565 Keywords Plus and 683 author keywords, reflecting the diversity of terminology in the literature.

Table 1
Main characteristics of the corpus.

Description	Result
<i>Main information</i>	
Timespan	1990–2025
Sources (journals, books, etc.)	164
Documents	268
Annual growth rate (%)	8.43
Document average age (years)	13.3
Average citations per document	56.31
<i>Document contents</i>	
Keywords Plus (ID)	1,565
Author's keywords (DE)	683
<i>Authors</i>	
Authors	999
Authors of single-authored documents	33
<i>Author collaboration</i>	
Single-authored documents	36
Co-authors per document	4.27
International co-authorships (%)	5.60
<i>Document types</i>	
Article	238
Review	30

3.2. Annual scientific production and citations

Annual output (Fig. 1) remained low during the 1990s (0–5 documents per year, with none in 1996) and between 2000 and 2007 (2–7 per year). It rose to 11 documents in 2008 and 15 in 2009, fluctuated between 6 and 15 per year from 2010 to 2016, and peaked at 19 in 2018. Output then ranged from 6 to 15 documents per year between 2019 and 2024 before reaching 17 in 2025. Mean total citations per document were highest for documents published in 1990 (1,259; one document), 1998 (452) and 1991 (304), and mean citations per year were highest for documents published in 1990 (34.03), 1998 (15.59)

and 2003 (10.73). Consistent with their shorter citation windows, documents published between 2021 and 2025 had lower values (mean total citations from 13.13 to 1.94; Supplementary Table S1).

The nonlinear growth model fitted to annual publication data (Fig. 2) explained 58.9% of the variation in annual output ($R^2 = 0.589$). It estimated a carrying capacity (K) of 397.52 documents and an inflection point (t_m) of the cumulative growth curve at 2018.30, at which annual output peaked at approximately 12.22 documents. Cumulative output reached 10% of the carrying capacity in 2000.43 and was projected to reach 90% in 2036.17 and 99% in 2055.68, giving an estimated transition period (Δt) of 35.74 years.

3.3. Sources

Child Abuse & Neglect was the most productive source (29 documents), followed by *Child Maltreatment*, *Development and Psychopathology* and *Pediatrics* (10 documents each; Table 2). Bradford's law partitioned the 164 sources into a core zone of 11 sources (6.7%) accounting for 91 documents (34.0%), a second zone of 64 sources (39.0%) accounting for 88 documents (32.8%), and a third zone of 89 sources (54.3%) accounting for 89 documents (33.2%; Supplementary Fig. S1).

Table 2
Ten most productive sources.

Rank	Source	Documents
1	Child Abuse & Neglect	29
2	Child Maltreatment	10
3	Development and Psychopathology	10
4	Pediatrics	10
5	Journal of Interpersonal Violence	8
6	Children and Youth Services Review	6
7	Aggressive Behavior	5
8	Journal of Family Psychology	5
9	Journal of Consulting and Clinical Psychology	4
10	Journal of Family Violence	4

3.4. Countries and international collaboration

Based on the corresponding authors' affiliations, documents originated from 31 countries (Table 3; Fig. 3). Output was highly concentrated: the United States accounted for 135 documents (50.4%), followed by Canada (14; 5.2%) and Germany (11; 4.1%). Most output consisted of single-country publications (SCP). Only 7 of the 135 U.S. documents (5.2%) were multiple-country publications (MCP), and all documents from Brazil, Turkey, the Netherlands, China, France, the United Kingdom, Iran and Italy were SCPs. The United States also received the most citations (9,586; 71.0 per document), whereas

Canada had the highest average number of citations per document among the leading countries (1,457 citations; 104.1 per document). The United States accounted for approximately 78% of the citations received by the ten most-cited countries (12,291). Complete country-level data are reported in Supplementary Tables S2 and S3 and Supplementary Fig. S3.

Table 3
Ten most productive countries (corresponding author) and their citation impact.

Country	Documents	% of corpus	SCP	MCP	MCP %	TC	TC per document
USA	135	50.4	128	7	5.2	9,586	71.0
Canada	14	5.2	12	2	14.3	1,457	104.1
Germany	11	4.1	10	1	9.1	377	34.3
Brazil	7	2.6	7	0	0.0	198	28.3
Turkey	7	2.6	7	0	0.0	92	13.1
Australia	6	2.2	5	1	16.7	82	13.7
Netherlands	6	2.2	6	0	0.0	95	15.8
China	5	1.9	5	0	0.0	129	25.8
France	5	1.9	5	0	0.0	44	8.8
United Kingdom	4	1.5	4	0	0.0	175	43.8
<i>Note.</i> SCP = single-country publications; MCP = multiple-country publications; TC = total citations. Countries were assigned according to the corresponding author's affiliation; percentages are calculated on all 268 documents. Data for all 31 countries are reported in Supplementary Tables S2 and S3.							

3.5. Authors

Lee S was the most productive author (8 documents), followed by Taylor C (7) and Tremblay R (6); in fractionalized counts, Holmes M (2.77) and Lee S (2.23) ranked highest (Table 4). Lee S also had the highest h-index within the corpus (8), followed by Taylor C (7) and Holmes M and Tremblay R (5 each); Bates J, Cicchetti D, Dodge K, Pettit G, Thompson R and Vitaro F each had an h-index of 4 (Supplementary Fig. S4). Author productivity was strongly skewed, consistent with Lotka's law: 90.6% of authors contributed a single document, 6.7% contributed two and 1.3% contributed three, with the proportion declining to 0.9% for four documents and 0.1% for six, seven and eight documents (Supplementary Fig. S2).

Table 4
Ten most productive authors.

Author	Documents	Documents (fractionalized)
Lee S	8	2.23
Taylor C	7	1.65
Tremblay R	6	0.83
Cicchetti D	5	1.62
Holmes M	5	2.77
Bates J	4	0.94
Dodge K	4	0.94
Godleski S	4	0.56
Nickerson A	4	0.56
Pettit G	4	0.94
<i>Note.</i> In fractionalized counts, each document is weighted by the inverse of its number of authors.		

3.6. Institutions

The University of Michigan was the most productive affiliation (16 documents), followed by the University of Pennsylvania (12) and Case Western Reserve University (10). Nine of the ten most productive affiliations were located in the United States (Table 5).

Table 5
Ten most productive affiliations.

Rank	Affiliation	Documents
1	University of Michigan	16
2	University of Pennsylvania	12
3	Case Western Reserve University	10
4	Tulane University	9
5	University of Maryland	9
6	University of Manitoba	9
7	University of Minnesota	8
8	University of Rochester	8
9	Columbia University	7
10	East Tennessee State University	7

3.7. Most cited documents

The most cited document was Dodge et al. (1990; 1,259 citations), followed by Kitzmann et al. (2003; 1,058) and Tremblay et al. (2004; 681; Table 6). Kitzmann et al. (2003) also had the highest number of citations per year (44.1), followed by Dodge et al. (1990; 34.0) and Tremblay et al. (2004; 29.6), and the highest normalized citation score (4.11), followed by Taylor et al. (2009; 4.05) and Tremblay et al. (2004; 3.84). These results indicate that a document's total citation count and its citation performance relative to documents of the same year can diverge.

Table 6
Ten most cited documents.

Document	DOI	TC	TC per year	Normalized TC
Dodge K, 1990, Science	10.1126/science.2270481	1,259	34.0	1.00
Kitzmann K, 2003, J Consult Clin Psychol	10.1037/0022-006X.71.2.339	1,058	44.1	4.11
Tremblay R, 2004, Pediatrics	10.1542/peds.114.1.e43	681	29.6	3.84
Straus M, 1999, Clin Child Fam Psychol Rev	10.1023/A:1021891529770	552	19.7	3.61
Weiss B, 1992, Child Dev	10.1111/j.1467-8624.1992.tb01697.x	489	14.0	2.90
Shields A, 1998, J Clin Child Psychol	10.1207/s15374424jccp2704_2	452	15.6	1.00
Vissing Y, 1991, Child Abuse Negl	10.1016/0145-2134(91)90067-N	304	8.4	1.00
Johnston J, 1994, Future Child	10.2307/1602483	242	7.3	2.13
Taylor C, 2009, Am J Public Health	10.2105/AJPH.2007.126722	218	12.1	4.05
Molnar B, 2003, Child Maltreat	10.1177/1077559502250822	206	8.6	0.80
Note. TC = total citations. Normalized TC = total citations divided by the mean total citations of corpus documents published in the same year.				

3.8. Most frequent words

The most frequent title words were "violence" (77 occurrences), "children" (73) and "aggression" (72), which together constituted the main thematic focus of the literature. They were followed by "child" (57), "behavior" (39), "physical" (38) and "childhood" (34), while "study" (31), "aggressive" (29) and "partner" (29) completed the ten most frequent terms (Supplementary Fig. S5).

3.9. Thematic map

The thematic map (Fig. 4) classified the research themes into four quadrants according to their centrality (relevance degree; x-axis) and density (development degree; y-axis). The upper-right quadrant contained one motor theme ("physical, families, family"), which was both well developed and central to the field. The upper-left quadrant contained niche themes ("developmental, predictors, conflict"; "aggression, risk, maternal"; and "parenting, health, mental") with high internal cohesion but weak external connections, suggesting specialized sub-domains. The lower-left quadrant contained one emerging or declining

theme ("violence, partner, intimate"), with low centrality and low density. The lower-right quadrant contained basic themes ("childhood, study, effects"; "children, child, maltreatment"; and "behavior, aggressive, children"), which showed high centrality but lower density, indicating foundational topics that anchor the research domain without being tightly specialized.

3.10. Conceptual structure

The MCA identified two dimensions organizing the conceptual space of the corpus (Fig. 5). The horizontal dimension mainly separated studies on parenting, parent–child relationships and psychosocial characteristics from studies on violence, aggression, abuse and maltreatment. Terms such as mother, infant, child, adolescent, parenting, parent–child relationship and psychological aspect were located mainly on the left, whereas physical aggression, child maltreatment, domestic violence, intimate partner violence, physical abuse and maltreatment were located mainly on the right. The vertical dimension further differentiated concepts related to parenting practices and interpersonal violence from developmental, behavioral and psychosocial outcomes. The upper region included punishment, parenting, prevalence, corporal punishment and intimate partner violence, whereas the lower region included neglect, childhood, behavior, mental health and longitudinal study. Concepts close to the center, such as violence, child abuse, physical abuse, aggression and risk factor, appeared to link the different thematic areas.

3.11. Temporal evolution of keywords

"Violence" and "aggression" were the earliest of the ten most frequent words, both appearing from 1990; "physical" and "aggressive" entered the vocabulary in 1994, "study" and "partner" in 2003, and "childhood" in 2004 (Supplementary Fig. S6). All ten words showed accelerating cumulative growth from 2008 onward. By 2025, "children" (72) led the cumulative count, followed by "aggression" (69), "violence" (69), "child" (56), "behavior" (39), "physical" (36), "childhood" (34), "study" (31), and "aggressive" and "partner" (29 each).

The trend-topic analysis (Fig. 6) ordered recurring terms by their median year of use. "Preschoolers" ($n = 5$) had the earliest median year (1998), followed by "family violence" ($n = 25$; 2007) and "risk factors" ($n = 32$; 2010). The highest-frequency terms reached their median year of use between 2012 and 2018: "child abuse" ($n = 104$; 2012), "aggression" ($n = 118$; 2014), "preschool child" ($n = 82$; 2017), "physical aggression" ($n = 33$; 2017) and "child maltreatment" ($n = 34$; 2018). The most recent terms were "adverse childhood experiences" ($n = 14$; 2020), "early-childhood" ($n = 7$; 2022) and "retrospective study" ($n = 5$; 2025).

4. Discussion

This bibliometric analysis mapped the literature on early childhood physical aggression and child maltreatment published between 1990 and 2025, covering 268 documents across 164 sources. The findings show sustained scholarly attention to childhood aggression, violence, parenting and maltreatment, spread across many journals and research groups. The central issue, however, is not the

volume of research but how far work on early aggression and maltreatment is conceptually and empirically integrated.

4.1. Growth and development of the field

Publication output increased over the study period, but not evenly. It rose in the 2000s and again in the 2010s, peaking in 2018, and subsequently fluctuated. These fluctuations should not be read as changes in the scientific importance of the topic, since output may also reflect shifts in indexing, funding and terminology, as well as the inclusion of studies addressing only part of the conceptual intersection.

The growing attention to early aggression is consistent with Tremblay's (2000) argument that the origins of persistent physical aggression must be sought in the first years of life. Tremblay et al. (2004) identified distinct developmental trajectories of physical aggression, including a subgroup of children who maintained high aggression throughout early childhood. Aggression therefore does not follow the same course in all children, and early environmental and family characteristics deserve close attention. Early childhood is a period of rapid development in behavioral regulation and interpersonal functioning, so identifying the factors linked to persistent aggression may clarify the pathways from early adversity to later behavioral difficulties. The present findings cannot show whether growth was driven by studies of maltreatment-related aggression or by broader research on violence, parenting and child behavior; that would require examining the substantive focus of the included documents. Likewise, the projected milestones of the nonlinear growth model, including the estimated carrying capacity and future publication dates, depend on the model specification and on the assumption that the observed pattern continues. They are best treated as model-based estimates rather than reliable predictions.

4.2. Physical aggression and child maltreatment

The intersection of physical aggression and maltreatment is particularly important in early childhood. Physical aggression is a normal part of development in young children, but when it is persistent or excessive it may signal problems that require further assessment; Tremblay et al. (2004) showed the importance of distinguishing trajectories rather than treating all aggressive behavior as a single entity. Aggression alone does not establish a history of maltreatment, and maltreatment does not inevitably produce persistent aggression.

Developmental psychopathology offers a useful framework for this relationship. Maltreatment may constitute a maladaptive relational setting that influences multiple psychological and biological domains (Cicchetti & Toth, 2005). Aggression therefore needs to be conceptualized in light of the child's broader situation, including caregiving relationships, emotional functioning, family context and exposure to adversity. Children with difficult or unstable caregiving histories may have more trouble reading social cues, regulating their emotions and forming secure attachments.

4.3. Publication patterns and disciplinary organization

The presence of maltreatment, developmental psychopathology and pediatric journals among the leading sources suggests that the literature spans several disciplines. Developmental and clinical psychology outlets may focus on aggression trajectories, behavioral regulation and developmental outcomes, while maltreatment and child protection journals are more directly concerned with abuse, neglect, family risk and safeguarding. This fits the interdisciplinary nature of developmental psychopathology, which considers interacting biological, psychological and environmental processes (Cicchetti & Doyle, 2016). The Bradford analysis showed that about one third of the corpus was concentrated in eleven core journals, with the remainder spread across a large peripheral group. Specialist journals thus appear to sustain research on maltreatment and aggression, while the wider distribution indicates that relevant evidence is also published in adjacent disciplines. Publication counts nonetheless reflect productivity, not influence: citation impact, readership, methodological quality and conceptual contribution are separate dimensions and should not be merged into a single judgment of a journal's importance.

4.4. Geographical distribution and international collaboration

Output was strongly concentrated in the United States, which also had the highest total citations, while Canada had the highest average number of citations per document among the leading countries. Citation totals partly reflect publication volume, document age and the visibility of established groups, so they are not direct measures of research quality. International co-authorship was rare (5.6%), so most documents had no recorded international collaboration. This raises questions about data sharing and cross-national comparison of early childhood adversity. Greater collaboration could support comparison of developmental trajectories across different caregiving and child protection environments, although domestic multidisciplinary collaboration is also important.

4.5. Author productivity and citation impact

Tremblay's presence among the most productive authors reflects the longstanding contribution of developmental research on early physical aggression, which emphasizes the emergence and course of aggression in the first years of life rather than focusing only on later antisocial behavior (Tremblay, 2000; Tremblay et al., 2004). The prominence of older publications suggests that foundational studies still shape the intellectual background of the corpus, although total citations depend partly on time since publication and should be read alongside annual and normalized indicators. Kitzmann et al. (2003) examined children's exposure to interparental violence, whereas Tremblay et al. (2004) addressed early physical aggression and its predictors. Together they show that the field draws on two related but distinguishable traditions: one concerned with children's exposure to violence and its consequences, the other with the emergence and persistence of aggressive behavior.

4.6. Institutional contributions

A small group of institutions contributed repeatedly, although the results do not show whether they collaborate closely. The predominance of U.S. institutions mirrors the country-level findings. Institutional

counts depend on affiliation assignment, author mobility and the recording of multiple affiliations, and a document may count toward several institutions, so the figures are not mutually exclusive shares of the corpus. The finding that nine in ten authors contributed a single document suggests that many researchers contribute occasionally while a smaller group publishes repeatedly, possibly because researchers enter the topic from developmental psychology, pediatrics, family studies, social work or child protection. It also highlights the value of sustained research programs that integrate developmental and maltreatment perspectives over time.

4.7. Keyword patterns and conceptual structure

The most frequent title words identify recurring broad concepts, but they do not establish relationships between constructs or show that articles jointly investigate aggression and maltreatment. The co-occurrence of "violence" and "aggression" may reflect interest in exposure to family violence, aggressive behavior among children, or violence as a wider social phenomenon. These are not interchangeable: exposure to violence is an experience or environmental condition, whereas physical aggression is a behavioral outcome, and physical abuse as a form of maltreatment differs from physical aggression displayed by a child.

In the thematic map, the basic themes combined high centrality with lower density, consistent with their functioning as the field's foundational, widely connected core rather than as tightly specialized sub-literatures. The motor theme ("physical, families, family") occupied the most developed and central position, suggesting that family-level framing of physical aggression is the field's most structurally mature line of work. The niche themes showed high internal cohesion but weak external connections, indicating specialized sub-domains (e.g., maternal-risk framings and parenting-and-mental-health framings) that have not yet been strongly integrated into the field's central vocabulary. The position of the "violence, partner, intimate" cluster in the emerging-or-declining quadrant is compatible either with an emerging line of inquiry that has not yet consolidated or with a declining one, and the thematic map alone cannot distinguish between the two readings.

The MCA offers a complementary, term-level view of this structure. Its horizontal dimension separated a parenting- and relationship-oriented pole from a violence- and maltreatment-oriented pole, echoing the conceptual boundary suggested by the thematic map: a developmental/relational tradition and a violence/maltreatment tradition that remain only partially integrated. Terms near the center of the map (violence, child abuse, physical abuse, aggression, risk factor) may function as conceptual bridges between the two poles, but a central position in a correspondence map indicates general co-occurrence across the corpus rather than confirmation that specific studies analytically connect the two traditions. As with keyword frequencies, cluster and correspondence positions describe the field's aggregate vocabulary; they do not establish, at the level of individual documents, how often physical aggression and maltreatment are investigated as a single, integrated phenomenon.

4.8. Temporal evolution of dominant keywords

"Violence" and "aggression" were present from the earliest years of the corpus, whereas "childhood," "study" and "partner" did not appear until the early-to-mid 2000s, and all ten dominant words grew steadily from 2008 onward, in step with the broader rise in annual output. The trend-topic analysis adds a complementary view. Generic methodological and descriptive terms (e.g., "priority journal," "psychological aspect," "cross-sectional studies") cluster in the field's earlier years, while the substantive core vocabulary ("child abuse," "aggression," "domestic violence," "preschool child") reaches its typical period of use between 2010 and 2017. Notably, "physical aggression" only reaches this point in 2017, even though the broader constructs it draws on ("aggression," "child abuse") were established earlier, and "child maltreatment" follows a similar pattern, with 2018 as its median year of use. This suggests that the explicit, joint naming of physical aggression and maltreatment as linked constructs is a comparatively recent development relative to the separate vocabularies on which each draws. The most recent terms ("adverse childhood experiences," "early-childhood" and "retrospective study") point toward an ongoing shift in the field, but with only a few years of data behind them, their trajectories (continued growth, plateau or decline) cannot yet be established.

4.9. Gaps in the current knowledge structure

Several structural gaps emerge from these results, beyond the geographic concentration already noted. First, specific developmental mechanisms linking maltreatment to aggression, such as inhibitory control, verbal and language skills, and the quality of mother–child interaction, do not appear among the most frequent keywords or trend topics, despite their prominence in the theoretical literature. This does not mean that they are unstudied, given the much larger pool of keywords underlying the corpus, but it suggests that they are not yet central, high-frequency concerns of the field as a whole.

Second, the niche themes ("parenting, health, mental"; "aggression, risk, maternal") combine high internal cohesion with weak external connections, pointing to a degree of fragmentation between parenting- and maternal-risk-oriented work and the field's central maltreatment vocabulary.

Third, "preschool child" ($n = 82$) is markedly more frequent than any term specific to infancy or toddlerhood, suggesting that the literature may be weighted toward the 3–6-year window rather than evenly distributed across early childhood.

Fourth, no intervention- or prevention-specific term appears among the most frequent keywords or trend topics, which, alongside the predominance of risk-factor and outcome-oriented vocabulary, suggests that the literature leans more toward documenting the aggression–maltreatment association than toward evaluating ways to interrupt it.

Finally, international co-authorship remains rare, and North Africa and the Arabic-speaking world were represented by only two documents (one each from Egypt and Qatar), with no documents from francophone Africa among the 31 countries identified. Whether this reflects an actual research gap or a limitation of the present search strategy cannot be determined from these data alone.

4.10. Implications for future research

First, longitudinal studies should examine how specific maltreatment experiences relate to trajectories of physical aggression across early childhood, separating transient behavior from persistent aggression and establishing temporal order (Tremblay et al., 2004). Second, studies should examine variation by maltreatment subtype, gender and form of aggression. Cullerton-Sen et al. (2008) found that associations varied by gender, maltreatment subtype, and whether physical or relational aggression was measured; although their sample was older, the findings show why these constructs are not uniform. Third, research should extend beyond individual outcomes to family relationships, parenting practices, emotion regulation and contextual adversity (Cicchetti & Doyle, 2016). Fourth, broader geographical representation and stronger international collaboration, including research from low- and middle-income countries, would show whether findings apply across cultural and child protection contexts. Future bibliometric work could also pair keyword mapping with document-level screening and citation-network analysis to separate broad thematic association from studies directly examining maltreatment and aggression in children aged 0–6 years.

4.11. Limitations

The analysis was restricted to the Web of Science Core Collection and Scopus, so studies indexed elsewhere may have been missed. The search depended on terminology in titles, abstracts and keywords, and the absence of a language restriction does not guarantee coverage of non-English research. The corpus included studies of different age groups and varying relationships between constructs, so not every publication can be assumed to focus on children aged 0–6 years or to examine both constructs; eligibility should be verified before strong claims about gaps are made. Citation indicators are affected by publication age, database coverage and disciplinary practices, and keyword networks depend on data cleaning and thresholds.

5. Conclusion

This analysis describes a growing, interdisciplinary literature on early childhood aggression, violence, family relationships and maltreatment, concentrated in a small group of journals, authors, institutions and countries. Keyword co-occurrence alone cannot establish how far early physical aggression and maltreatment are examined together. The study's main contribution is to map the landscape and identify questions for closer examination; combining bibliometric mapping with detailed study-level review would clarify where these traditions intersect and where further empirical work is needed.

Declarations

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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CRedit authorship contribution statement

Mariam Jardini: Conceptualization, Methodology, Investigation, Data curation, Project administration, Writing – original draft, Writing – review & editing.

Yatheesh Bharadwaj: Methodology, Formal analysis, Software, Visualization, Writing – original draft, Writing – review & editing.

Ethical considerations

This study used bibliographic data retrieved from scientific databases and did not involve human participants, patient records or identifiable personal information; ethical approval was therefore not required.

Data availability

The complete search strings are reported in Section 2.2. The bibliographic records were exported from the Web of Science Core Collection and Scopus under institutional subscriptions whose terms do not permit public redistribution of the full records. The list of included documents and the analysis settings are available from the corresponding author upon reasonable request.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work the authors used Claude (Anthropic) in order to help formatting the manuscript according to the journal's guidelines. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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