

Comprehensive Bibliometric Analysis of Autism Spectrum Disorder Research During Adolescence

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Abdelali Mrakna	Mohammed El-Mir	Oussama Sabili	Mariam Jardini
abdelali.mrakna@usmba.ac.ma	mohammed.elmir1@usmba.ac.ma	oussama.sabili-etu@etu.univh2c.ma	mariam.jardini-etu@etu.univh2c.ma
https://orcid.org/0009-0007-4011-1476	https://orcid.org/0000-0002-7876-0523	https://orcid.org/0009-0004-8519-4242	https://orcid.org/0009-0007-8447-0163
Faculty of Letters and Human Sciences, Dhar El Mehraz Sidi Mohamed Ben Abdellah University, Fes, Morocco		Faculty of Letters and Human Sciences, Mohammedia, Hassan II University, Casablanca, Morocco	
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Abstract

Objective: This bibliometric study charts five decades (1974–2025) of research on Autism Spectrum Disorder (ASD) during adolescence (ages 12–18). It aims to deliver a detailed, reproducible overview of publication trends, key contributors, and the evolution of research themes, using a transparent bibliometric approach.

Methods: Data were systematically gathered from the Scopus database, yielding 1,647 English-language journal articles that focused on or included specific analyses related to the adolescent age group. The study applied performance metrics and scientific mapping techniques, using tools such as VOS viewer and Publish or Perish. Fractional counting was applied at the country level, while full counting was used for other analytical layers.

The volume of research has grown rapidly, with nearly half of all publications appearing since 2020. Most work is concentrated in Psychology (33.8%), Medicine (31.7%), and Neuroscience (11.9%), and published in a relatively small number of specialized journals. The United States is the leading contributor (29.1%), followed by the UK and Canada. Collectively, the literature has significant impact, with 50,903 citations and an h-index of 107. Thematic mapping shows a clear shift from early descriptive and diagnostic studies toward areas like intervention, social participation, and quality of life.

Conclusions: Findings suggest that ASD research during adolescence has reached a mature stage but remains limited by language and regional disparities. The study advocates for broader international collaboration, harmonized impact metrics, and expanded multilingual databases to inform more inclusive and responsive adolescent ASD policies and practices.

Keywords: Autism Spectrum Disorder, adolescence, bibliometric analysis, research trends, knowledge mapping

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by challenges with social communication and interaction, and restricted, repetitive patterns of behavior (APA, 2013). DSM-5 classification: Autism Spectrum Disorder (ASD) emerges as a result of an atypical developmental trajectory; mild deficits in social and communicative abilities may be present in typical early development before a noticeable on-set that usually occurs within the first two years (often between 6 and 24 months but it varies from individual to individual) (Lord et al., 2020).

Adolescence, which usually lasts from ages 12 to 18, is a transitional time of growth defined by physiological change, growing cognitive skills and increasing social and academic pressures (Steinberg, 2017). With the unique challenges of these developmental stages, we are left wondering: how do kids with ASD handle it? Common challenges in social understanding, emotional control, and flexibility of behavior can further exacerbate typical adolescent maturation changes (Mazurek & Kanne, 2010) indicating the need for context-based support specific to this life stage.

Interest in ASD as a sentinel neurodevelopmental disorder, continues to grow throughout adolescence; however, most previous research includes small or was tightly defined samples which limits generalizability. While special announcements in the form of a meta-analytic perspectives and systematic reviews are helpful to provide broad strokes, they may miss important shifts in structural patterns, collaboration networks or thematic priorities over time (Lau-Zhu et al., 2019; Cohen & Pan, 2019).

In contrast, bibliometric analysis provides a solid quantitative method for measuring research output. It allows for the identification of key contributors made up of authors, institutions, and countries along with collaboration patterns and thematic shifts that provide a holistic view on a field's development (Donthu et al., 2021; Chen, 2006; van Eck & Waltman, 2010). Nevertheless, the systematic mapping of such kinds has not yet been operationalised to autism research encompassing adolescents.

The present study seeks to fill this gap and investigates the Scopus-indexed publications on ASD in adolescents published between 1974 and 2025. It identifies publication trends, influential players, key journals and fluctuations of the central keywords over time. By providing a comprehensive overview of the prior literature, this study seeks to delineate the intellectual structure and development of the field that could support future research as well as inform effective policy whether supported by evidence or not.

Literature review

Puberty entails the biological processes of maturing and becoming sexually viable as well as a multitude of changing social roles and expectations; these two elements together cause "adolescence" to be experienced differently by individuals with Autism Spectrum Disorder. These transitions taking place during these years can structure adolescents with ASD's experience of risk and challenge, making a difference to areas like official work working, mental health, peer connections and academic success (Steinberg, 2017; Lord et al., 2020).

Bibliometric analysis offers a systematic means of both assessing how much academic work is being produced with regards to the subject and also where trends are in relation to its publication and collaboration networks. Specific steps such as well-documented research procedures, precise duplication omission processes and use of standardized tools (3) (for example VOSviewer (4) or Publish or Perish tool which visualizes intellectual and social patterns in the discipline (Donthu et al., 2021; Zupic & Čater, 2015) are needed to implement this approach.

Previous bibliometric research in relation to autism had not fully recognized adolescence as a distinct developmental stage with its own scientific significance. Research is either generalised (e.g., lifespan / autism across the life course) or too narrow in scope, which does not lend itself to adolescent-specific issues (Lord et al., 2020).

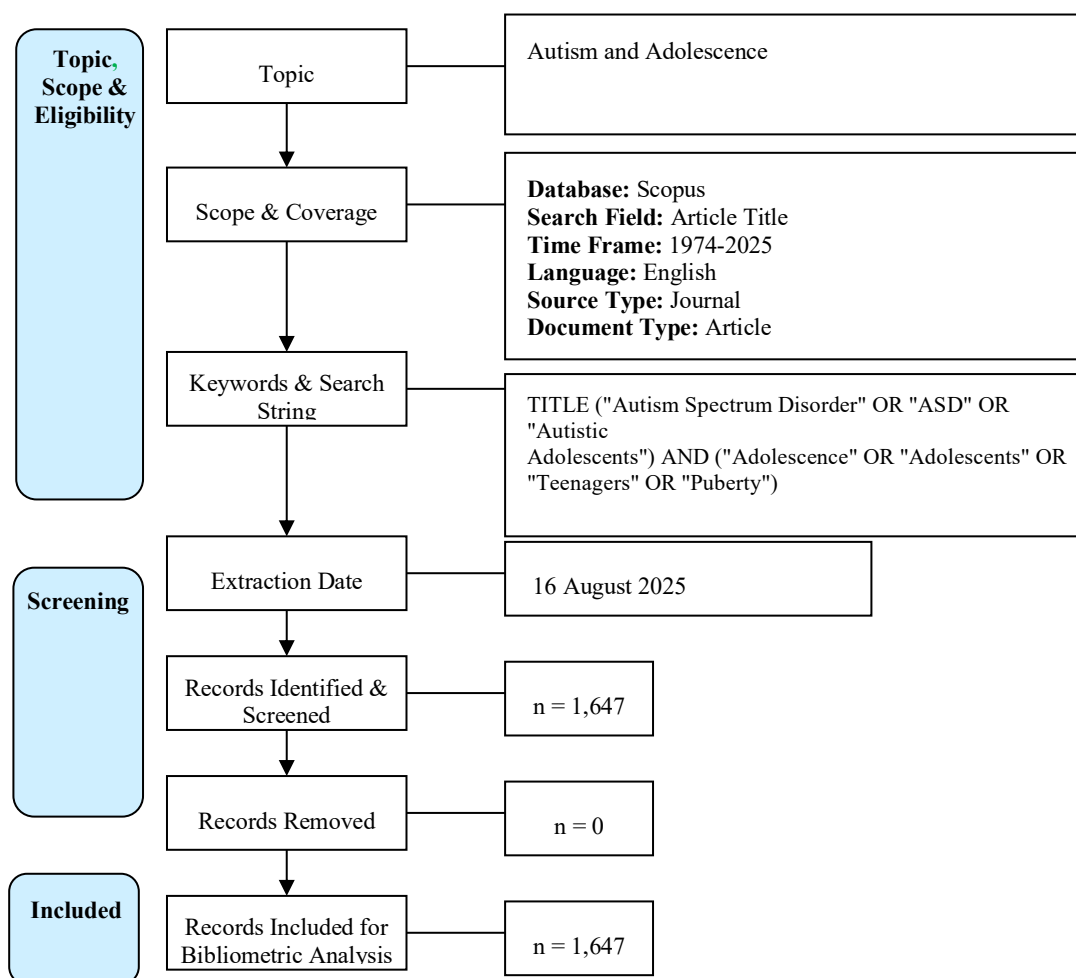
We chose to perform a bibliometric review on the theme of adolescence because it provides an opportunity to gain insights into whether, and if so how, research itself has shifted from focusing on early diagnostic aspects of mental health demonstrations towards topics that are likely to be more relevant to adolescents (e.g., cognitive support, mental health services provision and access, social belonging and progressing towards autonomy). It also assists in mapping out leading journals, dominant disciplines as well as collaborative domains driving the field.

This analysis integrates productivity evaluation and mapping methods, both providing ways for revealing the most influential scholars, institutions, journals and countries as well as evolving topics and conceptual anchors. Based on the rigorous selection criteria, outcome validation checks, and transparent categorization of counting strategies, this bibliometric mapping effort is more reliable (Donthu et al., 2021; Aria & Cuccurullo, 2017).

Methods

Figure 1

Flowchart of the bibliometric analysis process for studies on autism spectrum disorder (ASD) during adolescence (Adapted from Zakaria et al., 2020).



Results

Document and Source Types

Table 1

Distribution of publications by document type

Document Type	Total Publications (TP)	Percentage (%)
Article	1,647	100
Total	1,647	100.00

Note. All identified publications (N = 1,647) were classified as articles, representing 100% of the total dataset analyzed.

Table 2

Distribution of publications by source type

Source Type	Total Publications	Percentage (%)
Journal	1,642	99.70
Book series	5	0.30
Total	1,647	100.00

Note. The majority of publications were journal articles (n = 1,642; 99.7%), with a small proportion appearing in book series (n = 5; 0.3%).

Year of Publications/Evolution of Published Studies

Table 3

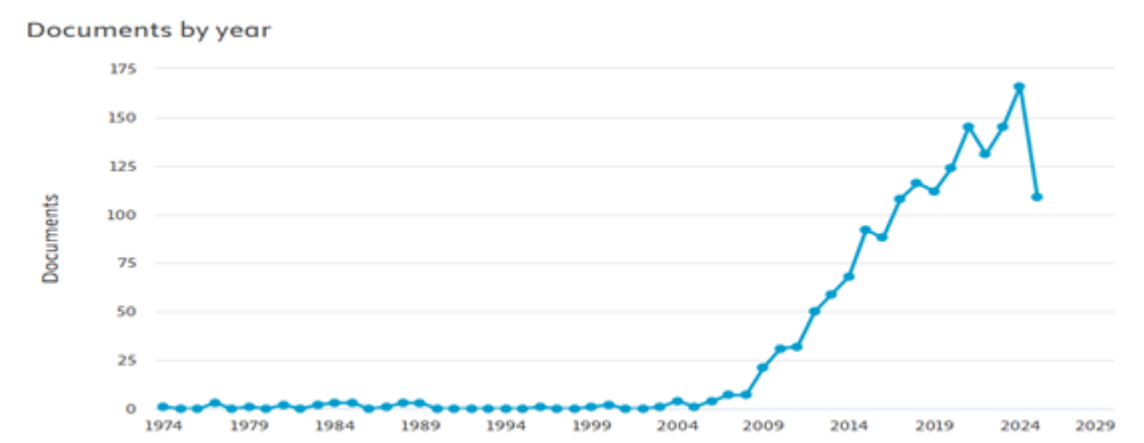
Yearly distribution and evolution of published studies on ASD and adolescence

Year	Documents	Percentage (%)	Cumulative Percent	Year	Documents	Percentage (%)	Cumulative Percent
2025	109	6.61	6.61	1999	1	0.06	98.59
2024	166	10.06	16.67	1998	0	0.00	98.59
2023	145	8.79	25.46	1997	0	0.00	98.59
2022	131	7.94	33.40	1996	1	0.06	98.65
2021	145	8.79	42.19	1995	0	0.00	98.65
2020	124	7.53	49.72	1994	0	0.00	98.65
2019	112	6.79	56.51	1993	0	0.00	98.65
2018	116	7.04	63.55	1992	0	0.00	98.65
2017	108	6.55	70.10	1991	0	0.00	98.65
2016	88	5.34	75.44	1990	0	0.00	98.65
2015	92	5.58	81.02	1989	3	0.18	98.83
2014	68	4.13	85.15	1988	3	0.18	99.01
2013	59	3.58	88.73	1987	1	0.06	99.07
2012	50	3.03	91.76	1986	0	0.00	99.07
2011	32	1.94	93.70	1985	3	0.18	99.25
2010	31	1.88	95.58	1984	3	0.18	99.43
2009	21	1.27	96.85	1983	2	0.12	99.55
2008	7	0.42	97.27	1982	0	0.00	99.55
2007	7	0.42	97.69	1981	2	0.12	99.67
2006	4	0.24	97.93	1980	0	0.00	99.67
2005	1	0.06	97.99	1979	1	0.06	99.73
2004	4	0.24	98.23	1978	0	0.00	99.73
2003	1	0.06	98.29	1977	3	0.18	99.91
2002	0	0.00	98.29	1976	0	0.00	99.91
2001	2	0.12	98.41	1975	1	0.06	99.97
2000	2	0.12	98.53	1974	1	0.06	100.00

Note. This table shows us the yearly publication of articles during these years (1974 — 2025). Very little research activity took place before 2000 (less than 2% cumulatively) while the past decade marks a clear upward surge, as almost half of the total output produced since 2020 (49.72%). The minimum contributions (one each) were in 2003 and 2005.

Figure 2

Annual Publication Trend of ASD Research During Adolescence (1974-2025)



Note. Before the mid-2000s, there were few annual publications; then they burgeoned after 2010 and grew steadily throughout the early to mid-2020s. The small downturn seen in the last year is probably due to indexing lags rather than a real decline, suggesting a quickly growing field

Languages of Documents

Table 4

Languages Used in the Analyzed Publications

Language	Total Publications*	Percentage (%)
English	1647	100
Total	1647	100.00

Note. The researcher has deliberately preferred to perform all records in English (100%) so as to ensure 2 important things i.e. Global reach and upmost similarity amidst the choice of comparability through each international.

Subject Area

Table 5

Subject Area of the Analyzed Publications

Field	Publications	Percentage (%)	Cumulative Percent
Psychology	886	33.77	33.77
Medicine	831	31.67	65.44
Neuroscience	311	11.85	77.29
Social Sciences	176	6.71	84.00
Health Professions	97	3.70	87.70
Arts and Humanities	82	3.12	90.82
Biochemistry, Genetics and Molecular Biology	52	1.98	92.80
Nursing	38	1.45	94.25
Multidisciplinary	32	1.22	95.47

Pharmacology, Toxicology and Pharmaceutics	25	0.95	96.42
Computer Science	24	0.91	97.33
Environmental Science	18	0.69	98.02
Agricultural and Biological Sciences	13	0.50	98.52
Engineering	11	0.42	98.94
Dentistry	10	0.38	99.32
Business, Management and Accounting	7	0.27	99.59
Chemistry	4	0.15	99.74
Economics, Econometrics and Finance	2	0.08	99.82
Veterinary	1	0.04	99.86
Mathematics	1	0.04	99.90
Materials Science	1	0.04	99.94
Immunology and Microbiology	1	0.04	99.98
Chemical Engineering	1	0.04	100.00
Total	2628	100.00	100.00

Note. Table 5 shows the distribution of publications, according to academic fields. The data set shows a strong interdisciplinary focus, with Psychology (33.77%), Medicine (31.67%), and Neuroscience (11.85%) constituting 77.29% of the combined publications (N = 2,628). The categorical diversity, with fields as varied as Social Sciences (23; 20.83%), Health Professions (14; 12.73%), and Arts and Humanities (8; 7.27%) points to the multidisciplinary nature of the research too.

Most Active Source Titles

Table 6

Most Active Source Titles in the Analyzed Publications

Rank	Source	Total publications	Percentage (%)
1	Journal of Autism and Developmental Disorders	311	18.88
2	Research in Autism Spectrum Disorders	88	5.34
3	Autism	83	5.04
4	Autism Research	74	4.49
5	Frontiers in Psychiatry	32	1.94
6	Research in Developmental Disabilities	27	1.64
7	European Child and Adolescent Psychiatry	21	1.28
8	Focus on Autism and Other Developmental Disabilities	17	1.03
9	International Journal of Environmental Research and Public Health	16	0.97
10	PLOS ONE	15	0.91
Subtotal (Top 10)		684	41.53

Note. Percentages were recalculated based on the full sample (N = 1,647). Some degree of concentration and long tail across additional venues with the top four journals accounting for ≈33.45% of all publications.

Keywords Analysis

Table 7

Top Keywords in the Analyzed Publications

Keyword	Total Documents	Percentage (%)
Autism	1,360	9.3
Human	1,303	8.9
Adolescent	1,282	8.7
Male	1,148	7.9

Keyword	Total Documents	Percentage (%)
Article	1,124	7.7
Female	1,071	7.3
Autism Spectrum Disorder	1,025	7.0
Humans	979	6.7
Child	948	6.5
Controlled Study	637	4.3

Note. The table contains top trending keywords of paper. The principal subject terms' ("result in autism", "Autism Spectrum Disorder") draw attention to the subject of interest within demographic and methodological indicators ("Humans/Humans", "Adolescent", "Male/Female, Child", "Controlled Study") reflecting the focused nature of clinical studies on Human being aimed at specific age and gender. "Article" only shows up because indexing began, not as a subject of research. Word count, based on their occurrences in the analysis: 10,877.

Geographical Distribution of Publications - Most Influential Countries

Table 8

Top 10 Countries Contributing to the Publications

Country	Total Documents	Percentage (%)
United States	723	29.1
United Kingdom	177	7.1
Canada	107	4.3
Australia	102	4.1
Netherlands	94	3.8
Italy	77	3.1
Japan	56	2.3
Germany	56	2.3
Taiwan	55	2.2
Spain	52	2.1

Note. About 60% of research output occurs in a limited number of high-income, Western countries including the United States (29.1% of publications, $N = 2,484$), UK, Canada and Australia. On the other hand, countries in the Global South are underrepresented, pointing to a pronounced geographical imbalance.

Authorship

Table 9

Most Productive Authors in the Analyzed Publications

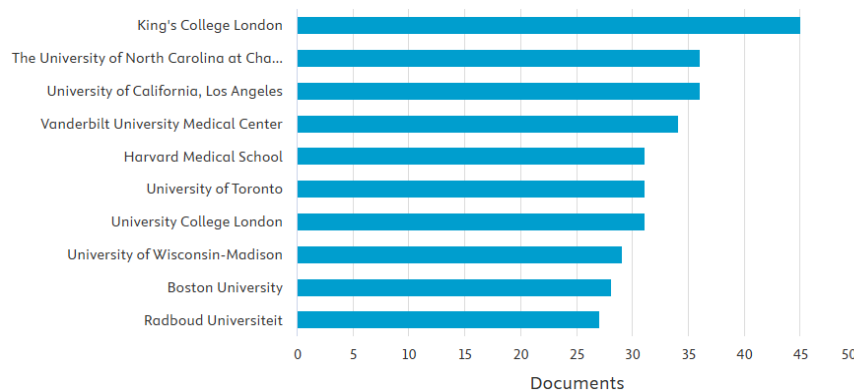
Author	Total Documents	Percentage (%)
Simonoff, E.	19	12.58
Mannion, A.	16	10.60
Leader, G.	16	10.60
Charman, T.	16	10.60
Corbett, B.A.	15	9.93
White, S.W.	14	9.27
Greaves-Lord, K.	14	9.27
Bölte, S.	14	9.27
Baird, G.	14	9.27
Yerys, B.E.	13	8.61

Note. Table of the 10 most prolific authors in the dataset. Most of the output is dominated by a small pool of top researchers. The contribution of the first five authors to this analysis makes more than one half (54.3%) of the publications.

Table 10*Most Productive Institutions in the Analyzed Publications*

Institution	No. of Documents	Percentage (%)
King's College London	45	13.72
The University of North Carolina at Chapel Hill	36	10.98
University of California, Los Angeles	36	10.98
Vanderbilt University Medical Center	34	10.37
Harvard Medical School	31	9.45
University of Toronto	31	9.45
University College London	31	9.45
University of Wisconsin-Madison	29	8.84
Boston University	28	8.54
Radboud Universiteit	27	8.23

Note. The table shows the 10 most productive institutions from the dataset. Research output is highly concentrated within a few flagship academic and medical centers. More than one-third (35.68%) of the publications in this analysis was produced by just three institutions. The list is heavily skewed to institutions in the US and UK with representation solely from Canada (University of Toronto) and the Netherlands (Radboud Universiteit).

Figure 3*Top 10 Most Productive Institutions in ASD Adolescent Research*

Note. The chart ranks the institutions that publish on ASD in adolescence. The top institutions are listed in the table, and it can be seen that King College London has most (45; 13.72%), followed closely by UNC–Chapel Hill and UCLA (36 each; 10.98%). Eight of the top ten are in the US/UK, reflecting a significant concentration on these markets and perhaps some degree of Western-bias in knowledge production. Total publications in this set by institution: 328.

Citation

Table 11*Citation Metrics for Autism Spectrum Disorder Research During Adolescence (1974–2025)*

Metric	Value
Publication years	1974–2025
Citation years	51 (1974–2025)
Papers	1,647
Citations	50,903
Cites/year	998.10
Cites/paper	30.91

Metric	Value
Cites/author	12,766.21
Papers/author	432.19
Authors/paper	5.14
h-index	107
g-index	159
hI norm	44
hI annual	0.86
hA-index	22

Note. The table is a summary of citation metrics for publications relating to autism spectrum disorder during adolescence. The data set consists of 1,647 papers spanning over a period of 51 years with an accumulated 50,903 citations. An h-index of 107 and g-index of 159 indicates considerable scientific impact with exceedingly high visibility and sustained seminal contributions across publications. Its average of 5.14 authors per paper represents collaborative research, and its cites/paper value (30.91) indicates a strong scholarly presence for the field overall.

Table 12

Most Highly Cited Articles on Autism Spectrum Disorder During Adolescence

No.	Authors	Title	Year	Cites	Cites per Year
1	S. Bellini, J. Akullian	A Meta-analysis of Video Modeling and Video Self-Modeling Interventions for Children and Adolescents with Autism Spectrum Disorders	2007	666	37.00
2	W. Mandy, R. Chilvers, U. Chowdhury, G. Salter, A. Seigal, D. Skuse	Sex Differences in Autism Spectrum Disorder: Evidence from a Large Sample of Children and Adolescents	2012	503	38.69
3	F. Volkmar, M. Siegel, M. Woodbury-Smith, B. King, J. McCracken, M. State	Practice Parameter for the Assessment and Treatment of Children and Adolescents with Autism Spectrum Disorder	2014	486	44.18
4	E.H. Aylward, N.J. Minshew, G. Goldstein, N.A. Honeycutt, A.M. Augustine, K.O. Yates, P.E. Barta, G.D. Pearlson	MRI Volumes of Amygdala and Hippocampus in Non-Mentally Retarded Autistic Adolescents and Adults	1999	425	16.35
5	P.T. Shattuck, M.M. Seltzer, J.S. Greenberg, G.I. Orsmond, D. Bolt, S. Kring, J. Lounds, C. Lord	Change in Autism Symptoms and Maladaptive Behaviors in Adolescents and Adults with an Autism Spectrum Disorder	2007	400	22.22
6	S.M. Kanne, M.O. Mazurek	Aggression in Children and Adolescents with ASD: Prevalence and Risk Factors	2011	394	28.14
7	S. Bellini	Social Skill Deficits and Anxiety in High-Functioning Adolescents with Autism Spectrum Disorders	2004	389	18.52
8	E.A. Laugeson, F. Frankel, A. Gantman, A.R. Dillon, C. Mogil	Evidence-Based Social Skills Training for Adolescents with Autism Spectrum Disorders: The UCLA PEERS Program	2012	384	29.54
9	M.M. Seltzer, M.W. Krauss, P.T. Shattuck, G. Orsmond, A. Swe, C. Lord	The Symptoms of Autism Spectrum Disorders in Adolescence and Adulthood	2003	368	16.73
10	A.L.C. De Vries, I.L.J. Noens, P.T. Cohen-Kettenis, I.A. Van Berckelaer-Onnes, T.A. Doreleijers	Autism Spectrum Disorders in Gender Dysphoric Children and Adolescents	2010	362	24.13
11	S.-J. Weng, J.L. Wiggins, S.J. Peltier, M. Carrasco, S. Risi, C. Lord, C.S. Monk	Alterations of Resting State Functional Connectivity in the Default Network in Adolescents with Autism Spectrum	2010	344	22.93

No.	Authors	Title	Year	Cites	Cites per Year
		Disorders			
12	D.F. MacFabe, N.E. Cain, F. Boon, K.-. P. Ossenkopp, D.P. Cain	Effects of the Enteric Bacterial Metabolic Product Propionic Acid... Relevance to Autism Spectrum Disorder	2011	299	21.36
13	A.T. Wang, M. Dapretto, A.R. Hariri, M. Sigman, S.Y. Bookheimer	Neural Correlates of Facial Affect Processing in Children and Adolescents with Autism Spectrum Disorder	2004	288	13.71
14	C. Boulter, M. Freeston, M. South, J. Rodgers	Intolerance of Uncertainty as a Framework for Understanding Anxiety in Children and Adolescents with Autism Spectrum Disorders	2014	281	25.55
15	S. Bellini	The Development of Social Anxiety in Adolescents with Autism Spectrum Disorders	2006	272	14.32
16	E. Van Roekel, R.H.J. Scholte, R. Didden	Bullying Among Adolescents with Autism Spectrum Disorders: Prevalence and Perception	2010	256	17.07
17	C.A. Mazefsky, J. Kao, D.P. Oswald	Preliminary Evidence Suggesting Caution in the Use of Psychiatric Self-Report Measures...	2011	252	18.00
18	M. Rosenthal, G.L. Wallace, R. Lawson, M.C. Wills, E. Dixon, B.E. Yerys, L. Kenworthy	Impairments in Real-World Executive Function Increase from Childhood to Adolescence in Autism Spectrum Disorders	2013	234	19.50
19	S.W. White, T. Ollendick, A.M. Albano, D. Oswald, C. Johnson, M.A. Southam-Gerow, I. Kim, L. Scahill	Randomized Controlled Trial: Multimodal Anxiety and Social Skill Intervention for Adolescents with Autism Spectrum Disorder	2013	232	19.33
20	J.F. Strang, L. Kenworthy, P. Daniolos, L. Case, M.C. Wills, A. Martin, G.L. Wallace	Depression and Anxiety Symptoms in Children and Adolescents with Autism Spectrum Disorders without Intellectual Disability	2012	231	17.77
21	S.J. Rogers, L. Bennetto, R. McEvoy, B.F. Pennington	Imitation and Pantomime in High-Functioning Adolescents with Autism Spectrum Disorders	1996	231	7.97
22	S.E. Goldman, A.L. Richdale, T. Clemons, B.A. Malow	Parental Sleep Concerns in Autism Spectrum Disorders: Variations from Childhood to Adolescence	2012	230	17.69

Note. The table shows the 22 most-cited papers in adolescent Autism Spectrum Disorder (ASD) research. The most influential publication, with 666 total citations, is the meta-analysis of video modeling interventions by Bellini and Akullian (2007). The majority of this list clearly reflects a high level of focus on interventions, neurobiological correlates and developmental trajectories of ASD symptoms. In particular, high annual citation rates for recent publications (e.g., Mandy et al. 2012; Volkmar et al. 2014) point to an increasing scholarly attention that researchers devote to sex differences and clinical practice guidelines. The periods (1999–2014) and topics covered illustrate both the historical origins and changing research priorities for adolescent ASD literature.

General Analysis of the Tables

Based on a sample of articles integrated between 1974 and 2025, which are accessible within the Scopus platform, this bibliometric investigation serves to depict ASD research over time as it centers specifically around adolescence. Before 2000, output was minimal, or close to nonexistent, but post-2010 output steadily increased so sharply that it peaked in 2020.

Publication outlets: In terms of publication outlets, research is very concentrated with

33.45% of all articles published in the top four journals and 41.53% in the top ten. Entries are all in the English language (a consequence of the researchers' decision to enhance outside considerations. This point is acknowledged later on as a possible source of biased language).

Core terms on autism and ASD are confirmed by keyword analysis, while support terms including human, adolescents, male/female, children and controlled study further highlight the dominance of clinical research with human subjects. A total of 10,877 keywords were analyzed.

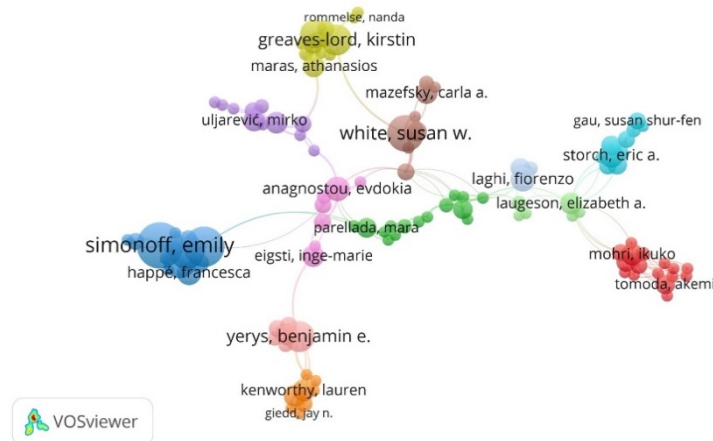
In terms of raw geography, the top three are the United States (29.1% of all research outputs), followed closely by the U.K., Canada and Australia. A lack of southern hemisphere representation (N = 2,884 in the footnote) of institutions, the leading university was King's College London (45 publications), followed by UNC–Chapel Hill and UCLA (36), highlighting the key role of U.K. and U.S. universities (328 institutions in total).

Citation metrics demonstrate creating a considerable impact (50,903 total citations, h-index 107, g-index 159) with an average of 30.91 citations/article, and highlighting authorship relation with collaboration alongside scholarly influence totaling to the figure of 5.14 authors/document). Transparent and reproducible search strategies, de-duplication processes, and the use of validated tools such as VOSviewer, Publish or Perish were all things present in this work. But limitations arising from language, type of document, and the scope of database might not allow to generalize these results broadly.

Co-authorship

Figure 4

Network visualization map of the co-authorship



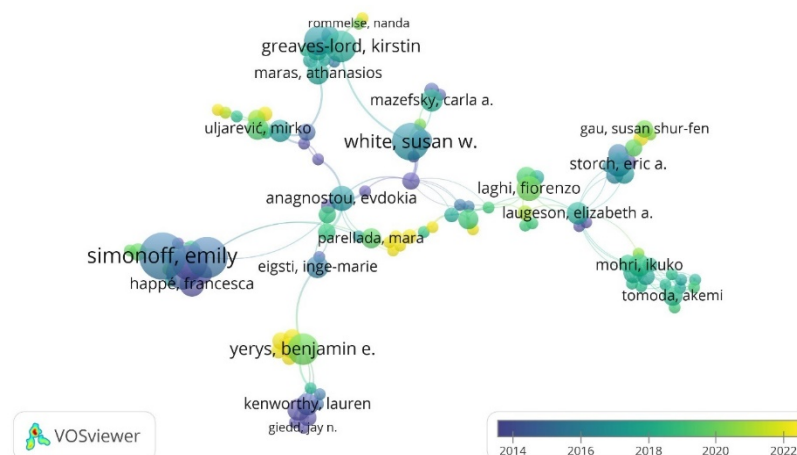
Unit of analysis = Authors

Counting method: Fractional counting

Minimum number of documents of a country = 3

Minimum number of citations of a country = 15

Figure 4 shows what the co-authorship network looks like at the author-level. Each node represents a single author and the edges show relationships between authors. The size of the nodes is in accordance with the number of publications and the thickness of links suggests cooperation strength. This visualization shows groups of authors publishing together, thus indicating the key research collaborative hubs.

Figure 5*Overlay visualization map of the co-authorship*

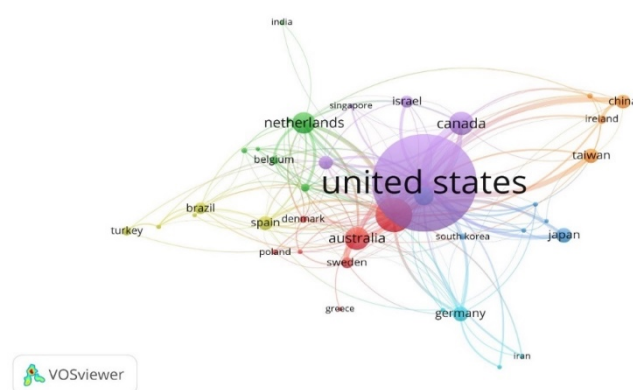
Unit of analysis = Author

Counting method: Fractional counting

Minimum number of documents of a country = 3

Minimum number of citations of a country = 15

The overlay visualization of co-authorship network at author-level is represented in this figure. The nodes are authors and the links represent collaborations. The main addition with the overlay visualization is simply that it provides an added temporal dimension; colors show average year of publication. Thereby, it will be possible to assess emerging authors and recent collaborations in comparison with more established ones.

Figure 6*Network visualization map of the co-authorship*

Unit of analysis = Countries

Counting method: Fractional counting

Minimum number of documents of a country = 5

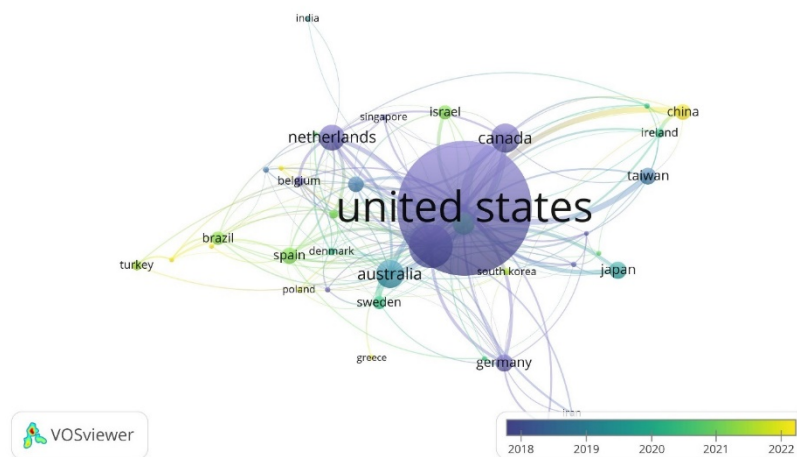
Minimum number of citations of a country = 5

This figure shows country-level international collaboration network. Each node represents a country, and links represent collaborations by researchers internationally from different countries. Node size indicates how many publications are affiliated with that country while the link strength reflects the intensity of international collaboration. This visualization

shows which countries are the most active in the field and how research collaborations around the world are structured.

Figure 7

Overlay visualization map of the co-authorship



Unit of analysis = Countries

Counting method: Fractional counting

Minimum number of documents of a country = 5

Minimum number of citations of a country = 5

This figure shows an overlay visualization of country-level co-authorship networks. The nodes represent the countries and the links are international cooperation. In this sense, the overlay adds a temporal layer, as nodes are colored according to their average publication year, making it easy to spot countries with more high-impact contributions versus those that have been active earlier. This assists in tracking the development of international cooperation across time.

The co-authorship network unveils a multi-clustered architecture with ongoing activity centered around stable research hubs. These central cores are separated by smaller, more specialized groups aligned with specific thematic foci (e.g., diagnostic techniques and neuroimaging; intervention approaches; or social participation) of which node size does not correlate directly with publication output, while the thickness of connecting lines reflects how strong and how often the collaboration is. Interdependence centrality measures indicate key 'bridge' researchers, revealing what would potentially be disparate clusters of team members together by linking teams across methodological area, (i.e., through connecting clinical and education or social science teams).

A temporal overlay of the country-level co-authorship network shows, however, great increase of activity post-2020 as illustrated in Fig x. New research teams and cross-cutting collaborations have made the network more cohesive and older, lonesome groups less siloed as time has progressed. This trend mirrors a thematic shift in the literature from predominantly descriptive or classification-oriented work to studies emphasizing interventions, functional outcomes, and adolescent quality of life.

Nationally, the map represents a stark divide between 'core' and 'periphery' actors. High-output countries cluster tightly around each other, while lower-output nations mostly interact in more sparse North–South associations, and even South–South linkages are relatively few. Such a situation explains the phenomenon of Western research persisting as frameworks and the parochial circulation of knowledge in the Global South.

This figure shows an overlay visualization of the co-occurrence network among author keywords. Nodes represent keywords and links represent keyword co-occurrence. But the overlay includes a temporal dimension, with node colors reflecting the average year the keywords were seen in publications. This enables one to identify not only established topics but also recent or emerging research directions in the field.

The co-occurrence network of keywords, built using author-provided terms and considering only nodes with at least five occurrences, shows a well-known yet intricately knitted thematic landscape.

Core terms like 'Autism', 'Autism spectrum disorder' and 'Adolescent' form an anchor at the center of the network. These key ideas sit in the middle of the other elements that create the framework around them.

Adjacent to this center are minuscule cluster of terms relevant to demographics and research design such as 'Human(s)', 'Male/Female', 'Child', and 'Controlled Study.' This is indicative of a focus on clinical research, and in particular studies utilizing adolescent samples.

As we go further out, the network focuses on clusters of contexts, assessment tools and intervention settings.

They contain keywords associated with school-centered settings, engagement frameworks and specific therapies or support models. Line thickness represents conceptual connections between the terms which combine to connect subclusters and allow integration of diverse subfields.

In the temporal overlay map, colour gradients indicate the mean year of publication for all documents within a given term. The continued existence of the founding elements is reflected by older clusters, whereas recent nodes, especially those appearing in the 2020s, ideate a landscape shift toward applied areas such as: treatment; inclusion; and adolescent well-being within educational and community contexts.

All in all, the keyword structure is centered on a handful of core terms that direct an entire landscape of applied research disciplines. The trajectory it displays is obvious: the discipline has shifted from description and diagnosis to much more practical questions asking what interventions are delivered into practice and how they work in the natural lives of adolescents with ASD.

Discussion

We conducted a bibliometric review of scholarly output on Autism Spectrum Disorder (ASD) that spans the years 1974-2025 (N = 1,647). Three major patterns emerge. Specifically, publication volume increased dramatically after 2010, with about 49.7% of all articles published in 2020 or later. What appears to be a dip in 2025 is probably due to indexing lag, rather than an actual decline. Second, research is localized: by discipline (Psychology 33.77%, Medicine 31.67%, Neuroscience 11.85%), by outlet ($\approx 33.45\%$ of papers in the top four journals; $\approx 41.53\%$ in the top ten), and geographic district (29.1% of author affiliations are from a U.S.). Third, data on findings demonstrate an obvious thematic development—from descriptive and diagnostic studies to intervention research, social inclusion studies and quality-of-life outcomes throughout adolescence.

Positioning the Findings Within Existing Research

This growth trend parallels systematic trends observed over the past decade in child and adolescent mental health research overall, likely due to increased funding support and service system development across different sectors, as well as improved data infrastructures. Given ASD's origins in developmental psychopathology, pediatric psychiatry, and cognitive

neuroscience, this trio of disciplines is perhaps not unexpected. In contrast, the under-representation of education and social sciences indicates an ongoing deprioritization of school, family, and systems-level variables factors crucial to adolescent adjustment and everyday functioning.

A highly concentrated publication practice within autism-specialty journals indicates a strongly developed disciplinary core that promotes rapid communication of ideas and some degree of methodological coherence. However, it also creates the danger of epistemic constriction constraining cross-pollination with adjacent fields including community psychology, educational assessment and implementation science.

Interpreting Science-Mapping Signals

A mapping of the co-occurrence of keywords indicates a field originating in fundamental principles (e.g., autism/ASD and development in adolescence) and moving toward practice (e.g., intervention, participation, & quality of life). More recently – although these are undoubtedly active research fronts – neurocognitive profiles, gender differences and treatment effectiveness are emphasized by bibliographic coupling, which reveals that the vast majority of this work is finding a home in a small imbricate of journals and researcher networks.

Methodological Reflections

The study applied a validated workflow that integrated productivity metrics with scientific mapping tools (VOSviewer) by using fractional counting for country-level analysis and full counting for authors, institutions, and sources. Several design choices warrant clarification:

Intentionally limiting the language and cultural representation of the literature to a single English source (Scopus). The limited language and cultural representation restricting this scope might have embedded an imperialist Western lens, thereby under-representing research published in non-Western languages or alternative formats (for example: reports, non-indexed journals).

Keyword Quality & Indexing Artifacts: Overuse of generic terms (e.g., “Human,” “Article”) is indicative indexing. Cleansed author keywords, as well as merging of synonymous terms (e.g., ASD = Autism Spectrum Disorder), and removal of sets of administrative terms, were used to refine the analyses.

Impact Metrics: Including field and age-normalized measures (RCR, CPP, FCSI) would allow for greater interpretability across disciplines and time periods due to the rise after 2020 as well as the wide timeframe of the study.

Implications for Research and Practice

Expand the Evidence Base: Future work should include non-English databases (e.g., SciELO, LILACS, CNKI) and repositories at the interface of education and public policy to provide a greater capture of context-specific information on family support, school inclusion, and adolescent services.

Converging Disciplines: Key adolescent issues pertaining to bridge components such as transition planning, vocational preparedness, mental health comorbidities and community inclusion will need broader cross-sector integration across education, public health social policy, and implementation.

Focus on youth-relevant ? and center on practical outcomes: More research should focus on real-world outcomes that matter to all teens, such as school completion, independent

living, employment and social inclusion. Increasing the use of designs like RCTs and implementation trials can help to distinguish between strong evidence and writing a check.

Restructure for Equity and Global Justice: Efforts to lead against the current Western-centered ecosystem, backed by South–South collaborations, fair author-ships (who deserves to be compilers ?), publication fee waivers, special issues calling attention to under-represented contexts.

Strengths and Limitations

This review has significant strengths in taking a long-range perspective (50 years), specifically for adolescents, and importantly integrating productivity data with mapping approaches to capture both the structural (who/where) and thematic (what/when) of studies conducted in adolescent populations. Nonetheless, some limitations deserve attention:

This overreliance on Scopus and English language content has a fundamental pull towards non-representation of world-wide scholarship.

The keyword data can be misleading, if not cleaned and harmonized, due to the presence of indexing artifacts.

Field-normalized impact metrics are not available, limiting cross-disciplinary comparisons.

These limitations do not negate the results, but highlight the potential of multilingual, multi-database updates adding value and depth to this analysis.

Future Directions

Future Directions: we advocate for a multi-lingual, pre-registered follow-up harmonized keyword datasets, field-normalized impact metrics and expanded coverage of the database (e.g. Scopus, Web of Science, PubMed). These overlays would enhance understanding:

Longitudinal Transition to Adulthood Studies: Follow studies that examine late adolescence and the transition to adulthood.

Intersectionality: Research on gender diversity, co-occurring conditions (e.g. anxiety, ADHD), and socioeconomic factors (provided as supplementary material)

Real-World Implementation: Assess outcomes of the programs being developed for schools or community settings.

Funding recognition data could also reveal how global financial flows draw geographies of research, thereby informing more inclusive long-term balanced knowledge systems.

Conclusion

This review maps five decades of adolescent ASD research, illustrating a rapidly expanding field post-2010 still firmly anchored in Psychology, Medicine and Neuroscience. Research is highly centralized in a handful of journals and mainly Western institutions. There is a clear trend towards studies on interventions, social inclusion and health-related quality-of-life relevant to adolescence in science mapping. But the over-use of particular languages, venues and geographies can box in cultural & contextual relevance. In the years ahead, a wider range of evidence sources (multilingual, multi-database), better methodological correspondence (e.g. harmonized keywords, normalized impact metrics), and fairer cross-region collaboration especially with education and social policy sectors that affect everyday life experiences and transitions to adulthood will enhance the field. This map, aimed at work

focused on adolescents, provides a replicable foundation for measuring progress and directing support towards meaningful and relevant real-world questions.

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