

## Visualising the research landscape on financial issues among special needs children: A bibliometric analysis from 1992 to 2024

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**Abstract:** A special needs family requires proper guidance as there are emotional and financial aspects involved in planning. The global concern surrounding financial planning for families with children who have special needs poses a significant risk to the well-being of these families. This study presents a bibliometric analysis of research on financial issues among special needs children, using data from the Scopus database. The analysis covers 32 documents published between 1992 and 2024, focusing on three main aspects: the evolution of research, major contributors, and keyword mapping. This study developed visualisations and integrated data using VOSviewer 1.6.15 and Harzing's Publish or Perish, respectively. The results show a slow but steady growth in publications since 1992, with a dramatic increase after 2012. The United States dominates the research landscape regarding publications and citations, followed by China, Australia, and the United Kingdom. The most productive institutions and authors are identified, along with the most frequently cited papers. Keyword analysis reveals a focus on autism, economics, and children, with emerging themes such as financial well-being, coping behaviour, and mental health. The study highlights the need for more interdisciplinary and global research efforts to address the complex financial challenges faced by families with special needs children. This study is considered to be reasonably representative as it focused on papers indexed in the Scopus database. This bibliometric study can be utilised as an initial undertaking in doing systematic literature reviews and meta-analyses. The findings are expected to stimulate future research and provide direction for advancing the field of study. The findings can also inform future research directions and policy initiatives aimed at addressing the financial challenges faced by families with special needs children. Limitations and suggestions for further research are discussed.

**Keywords:** *Bibliometric analysis, Financial planning, Harzing's publish or perish software, SCOPUS, Special needs child, VOS viewer.*

### 1. Introduction

The financial challenges experienced by families with children who have special needs are a major concern, as evidenced by numerous studies. Studies suggest that families with special needs children (SNC) have elevated expenses and distress as a result of the care demands (Kuo et al., 2011). Parents of SNC may incur substantial personal medical costs (Walter et al., 2018). Insufficient insurance coverage among these SNCs has been linked to difficulties in accessing healthcare, challenges in utilising healthcare services, and financial burden on families (Kogan et al., 2005).

Caring for individual SNCs can be expensive. Studies have demonstrated that families face several financial challenges beyond healthcare expenditures, including high out-of-pocket spending, obstacles linked to health plans, decreased involvement in the labour market, and worries about the quality of care (Busch & Barry, 2009). Kenneson and Bobo (2010) asserted that providing care for SNC, such as muscular dystrophy, can result in stress, which can have negative effects on the well-being and financial

situation of carers. In other words, families with special needs children face significant financial burdens due to medical and healthcare expenses, therapies, respite care, productivity loss, special education needs, and insurance coverage (Rogge & Janssen, 2019). The wider social environment might worsen financial difficulties for families with SNC. Parents may have challenges in achieving work-life balance as a result of the demands of their family, which can have an impact on their daily lives and overall satisfaction (Calderwood et al., 2022). Parents with special needs children often experience severe financial, social, and emotional burdens as they prioritise their children's needs over their own (Van Bourgondien et al., 2014). In some cases, family members experience various physical and psychological impairments that affect their career development, causing unemployment and increasing financial burdens (Ou et al., 2015). McConachie et al. (2005) asserted that having an SNC will cause 14 per cent of income losses. This income reduction will further deplete their existing financial resources during increased financial needs. The loss of employment and other out-of-pocket expenses would have restricted the parents from accessing healthcare services that are part of the employee's benefits; this situation would further contribute to negatively impacting the parent's financial situation.

Another interesting issue is related to the future financial independence of SNC. Planning for SNC is essential to ensure they are financially independent when they reach adulthood (Sharpe & Baker, 2007). Kapadia's (2019) study used data from the survey by MassMutual and discovered that nearly 40 per cent of families with autistic children face difficulties accumulating wealth for long-term financial needs. Sivakumar (2023) suggested a way to safeguard the child's future financial support through establishing a special needs trust. The trust can help protect assets and ensure that the child with special needs continues to receive necessary support even after the parents or caregivers are no longer able to provide it (Sivakumar, 2023). It is also important to consider estate planning, including naming a guardian and creating a will, to ensure that the individual with special needs is cared for and supported in the event of the parents' or caregivers' death (Gabileo, 2018).

Focusing on children with autism spectrum disorder (ASD), previous studies discovered that parents of children diagnosed with autism would experience more severe financial issues and greater stress experience that affected their overall well-being (Kogan et al., 2008; Ellis et al., 2017; Fletcher et al., 2017 Weiss et al., 2014). According to Järbrink et al. (2003), the total cost of caring for children with ASD is three times more than that of typically developing children. Further, Anderson et al. (2020) asserted that many families who have children with ASD sometimes face financial difficulties, which may necessitate assistance from safety net programmes. To summarise, the literature study highlights the intricate nature of financial matters concerning children with special needs. Robust support networks are essential in mitigating the financial load on families, taking into account healthcare expenses, wider financial obligations, and considerations for achieving a balance between work and personal life.

Before conducting the study, the main search inquiry was performed. It was carried out to gain more understanding into the degree to which this topic matter has previously been studied using bibliometric analysis. Despite the growing research interest in financial issues related to special needs children, there has been no comprehensive bibliometric analysis of the literature to date. Google Scholar was used to do additional research using the same search keywords. Following the search, the same result had been obtained. However, it is worth mentioning that the search yielded three studies on systematic literature review. The studies focused on identifying intervention approaches in promoting well-being in parents of children with autism (Frantz et al., 2018), emotion regulation measurement in individuals with autism (Weiss et al., 2014), and the general impacts of ASD on the parents (Alkhateeb et al., 2022).

Under the above circumstances, carrying out the bibliometric analysis on financial issues related to special needs children would be worthwhile. Bibliometric analysis can help identify trends, gaps, and opportunities in the literature, informing future research directions and policy initiatives to support families with special needs children better. This study aims to fill this gap by assessing the evolution of research, highlighting major players, and visualizing the mapping of keywords in this field. The analysis focused on the impact of these issues on both individuals and society, as well as the practicality of applying theoretical concepts. Mansour et al. (2022) assert that bibliometric research is conducted to evaluate scientific information published in various journals.

This paper focuses on three key research concerns. Firstly, it discusses the progress made in studies on 'financial issues involving special needs children'. Subsequently, the research delves into the essential domains and prominent contributors. After providing a detailed explanation of the study's methodology, the subsequent section presents the bibliometric analysis findings, their interpretations, and a subsequent discussion. The conclusion provides a concise summary of the findings, including any limitations, and offers suggestions for future research pertaining to 'financial issues related to special needs children'.

## 2. Material and Methods

### 2.1. Research Design and Objectives

This study aimed to expand understanding by examining, evaluating, and assessing current scientific literature on 'financial issues related to children with special needs', which consequently may help in identifying research gaps, trends, or future directions. The bibliographic data obtained from the Scopus database was used for this purpose. The study used the Scopus database over a single database as Scopus is a citation index that stores records with information on citations made in publications. Scopus is a large curated database that contains abstracts and citations from scientific journals, conference proceedings, and books. It has extensive coverage both globally and regionally (Ahmi, 2021). The Scopus allows users to determine which publications have cited a particular publication and provides the number of times a publication has been cited.

The procedure consists of four discrete stages: study planning, data collection, data analysis using bibliometrics, and dissemination of findings. The identified records have been subjected to bibliometric analysis to condense the bibliographic information (Ahmi, 2021) and examine the structural and social connections among various research components, such as keywords, authors, countries, and institutions (Donthu et al., 2021). The methodology of this study is based on the process used to gather and organise the data until it is fully collected, consistent, and ready for analysis. Prior to this point, it was necessary to identify the topic and the scope of the investigation based on the research objectives. There are three main research objectives for this study.

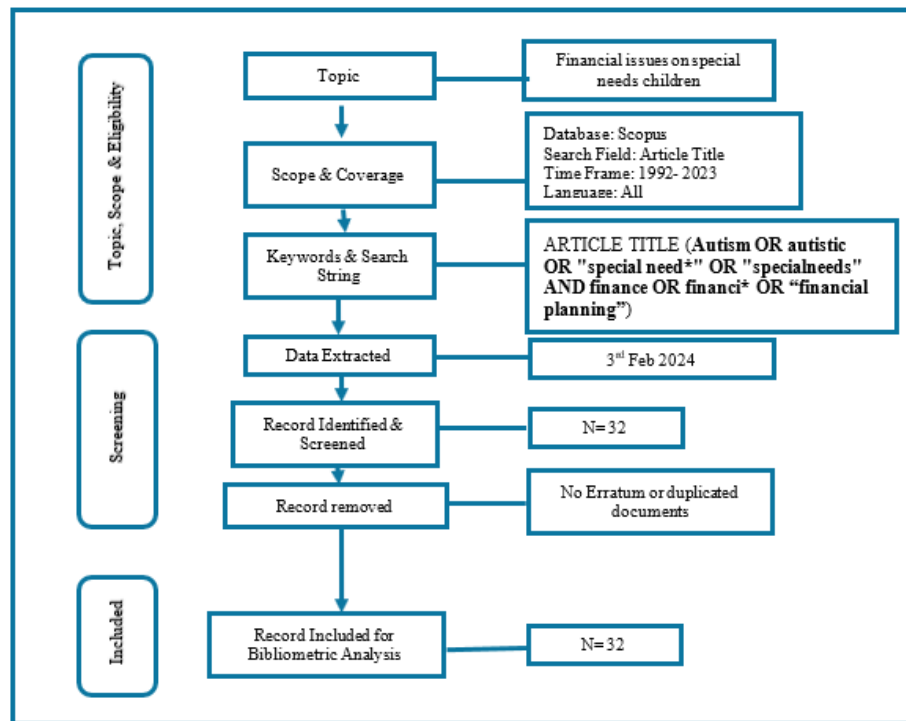
1. "To understand the evolution and dissemination of research",
2. "To evaluate the major players of research", and
3. "To map the state of the art of publications".

### 2.2. Data Source and Search Strategy

Data for this study were retrieved from the Scopus database on 3<sup>rd</sup> February 2024. This study primarily focuses on the publications regarding financial matters of children with special needs available in the Scopus database. The decision has been made to use the Scopus database, which is widely recognised as the most comprehensive abstract and indexing database ever created. It is also the largest searchable collection of citations and abstract literature available (Kokol et al., 2021; Nasir et al., 2021; Mansour et al., 2022; Sahib & Stapa, 2022; Nawi et al., 2023).

This study employed positional operators, such as double quotation marks, in combination with logical operators, such as brackets, and the terms "OR" and "AND", to provide more accurate and relevant outcomes. The subsequent investigation was conducted during this study: ARTICLE-TITLE: (Autism OR autistic OR "special need\*" OR "special needs" AND finance OR financi\* OR "financial planning"). The search inquiry was undertaken to fulfil the primary objective of this study, which entailed discovering publications pertaining to financial matters concerning children with special needs.

The database does not impose any limitations on the "year of publication", "document type", "subject area", "country", or "language". A total of 32 documents were obtained from the Scopus database. During the data cleaning process, the authors thoroughly examined the database for any instances of duplication (i.e., similar documents), erratum (i.e., correction document), inaccuracies (i.e., wrong document), or corrupted documents (i.e., wrong document). No document was removed after the completion of the data cleansing process. Therefore, all 32 documents were used for the Bibliometric Analysis. Figure 1 presents a succinct overview of the specific methods employed to gather data and establish the criteria for inclusion in this study.



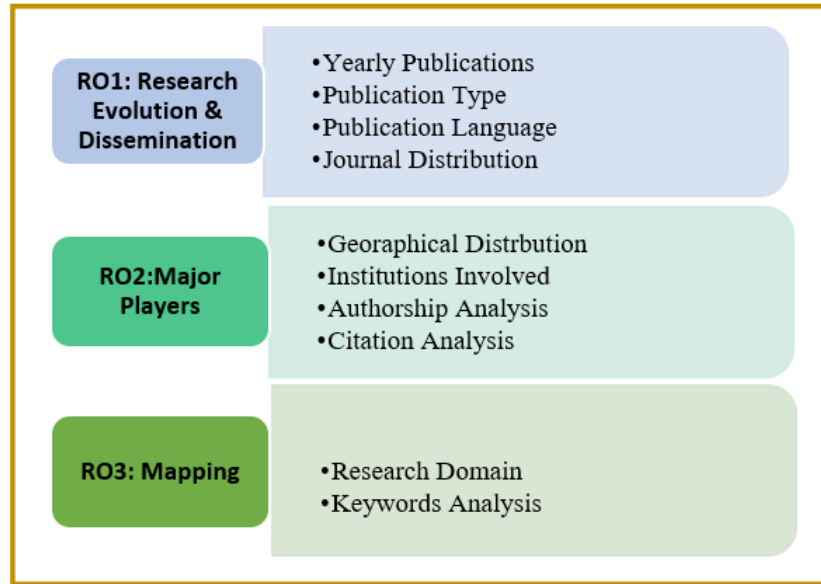
**Figure 1.**  
A Flow Diagram of the search strategy for this study.

### 2.3. Analytical Methods

This study utilised the Scopus database to generate a graphical representation of the growth in publications and total citations of scholarly articles on 'financial issues on special needs children' between 1992 and 2024. By utilising the 'analyse search results' function on the Scopus website, numerous analyses were promptly obtained from Scopus. The data extracted from the Scopus database was stored in comma-separated values (.csv) and research information systems (.ris) formats.

To create network visualisation maps of the data, this study utilised VOSviewer software (version 1.6.15). The software offers distinct benefits, particularly in the field of clustering analysis (Nawi et al., 2023). The assessment of the visualisation maps was categorised into two distinct components: Keyword analysis and Title analysis. Bibliometric networks were created and displayed using VOSviewer. This software uses visual representations to depict the authors' keywords and elucidate their interrelationships through variations in font sizes, square sizes, colours, and line thickness. Concurrently, the research employed Harzing's Publish or Perish software to integrate data and examine the citation metrics of the data. The data were evaluated either manually or with Microsoft Excel.

The current analysis assessed the following variables: yearly publications, type of publication, language of publishing, journal distribution, research category, frequently used keywords, country/region, affiliation, funding sources, authorship and co-authorship, and highly cited papers. Figure 2 illustrates the technique used in the current bibliometric study, which aligns with the research objectives.



**Figure 2.**  
The protocol for the bibliometric analysis study.

### 3. Results

This section contains the findings of the bibliometric analysis. The findings are organised into three subsections, aligning with the previously indicated research objectives:

1. Research evolution and dissemination;
2. Major players in the field; and
3. Research mapping.

#### 3.1. Research Evolution and Dissemination (RO1)

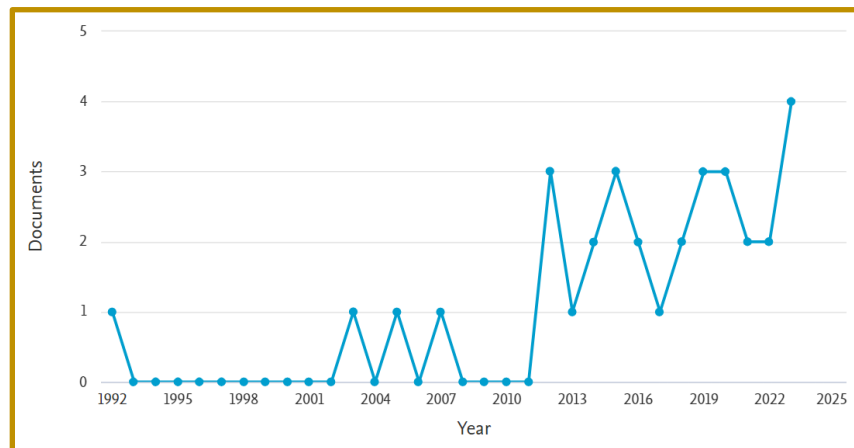
This study looked into the following to answer the first research question yearly publication, publication type, publication language, and journal distribution.

##### 3.1.1. Yearly Publications

As aforementioned, a systematic search of the Scopus database resulted in the identification of 32 publications. In 1992, Avery and Mont conducted the first study on the financial challenges faced by children with special needs. The paper, titled "Financial support of children involved in special needs adoption: A policy evaluation", was published in the "Journal of Policy Analysis and Management". The research on financial concerns affecting special needs children has experienced a surge in interest since its initial publishing. Approximately a decade after the initial paper, Ward (2003) published the second paper.

The trend initially exhibited a gradual pace, but it subsequently experienced a consistent and progressive increase starting in 2012. According to Figure 3, the year 2024 is projected to have the highest number of publications since 1992. Between 2012 and 2023, there was a peak in the number of publications, with a total of 28 documents, accounting for 87.5% of all publications. This analysis indicated a strong interest in the subject, emphasising the importance of researching 'financial issues on special needs children'.

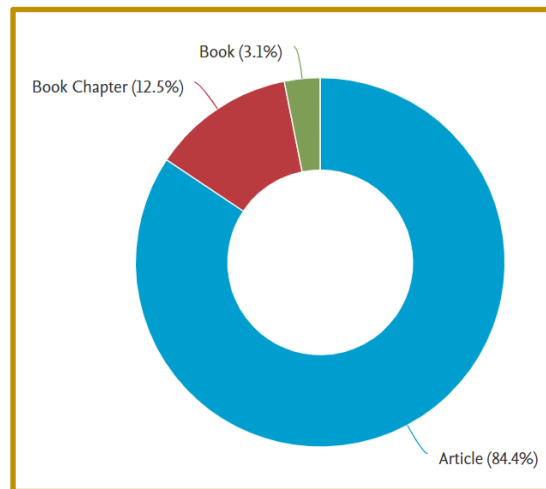
Remarkably, the findings indicate that the first study was conducted by experts from Western countries. Following the turn of the millennium, researchers from the East, particularly Asia, started to be attracted to this field of study. Ou et al. (2015) authored the inaugural study on 'financial matters concerning children with special needs' in China.



**Figure 3.**  
Publications by year.

### 3.1.2. Document and Source Types

Unlike most studies on other topics, which were published in various document types such as articles, conference papers, book chapters, books, reviews, erratum and notes; the study on topics related to 'financial issues on special needs children' was published in three document types only. The data in Figure 4 illustrates that article is the most dominant document type, accounting for 84.4%, followed by Book chapter (12.5%) and Book (3.1%). Alternatively, Table 1 lists the two source types. Journals represented more than four-fifths of all sources.



**Figure 4.**  
Document type.

**Table 1.**  
Source Type

Source type	Frequency	Percentage (%)
Journal	27	84.38
Book	5	15.62
Total	32	100

### 3.1.3. Publication Languages

All documents on topics related to ‘financial issues on special needs children’ were written in English, except for two documents which were written in Mandarin and French. Table 2 displays the remaining document languages. English-language abstracts are provided for all published documents, regardless of the language in which they were produced.

**Table 2.**  
Publication languages.

Languages	Frequency	Percentage (%)
English	30	94%
French	1	3%
Chinese	1	3%
Total	32	100

### 3.1.4. Journal Distributions

Furthermore, the data were analysed in relation to the Source Title. The ranking of the journals was based on the quantity of documents. Given the small number of documents, this study presents a comprehensive list of all documents, which may be found in Table 3. The list showed that the maximum number of documents for the source title is only two documents; two (2) were from Books and two were from a journal source type. The two journals are “Intellectual and Developmental Disabilities” and “Autism”. The journals have been covered by Scopus under the “SAGE” and “American Association on Intellectual and Developmental Disabilities” as the publishers since 1997 and 2007, respectively.

It is worth mentioning that the “Journal of Family and Economic Issues” had the greatest influence (with 105 citations) on ‘financial issues on special needs children’ despite publishing only one (1) document. Table 3 also includes information on the **SCImago Journal Rank** (SJR) indicator, cite score and Quartile of the journal. Notably, out of 25 source titles (journals), NINE (9) is under Q1, NINE (9) is under Q2, FOUR (4) journals have discontinued coverage in Scopus; and the remaining are under Q3 and Q4.

**Table 3.**  
Journals publishing research on ‘financial issues on special needs children’.

Rank	Source title	No of documents	Citations	SJR (2022)	Cite score (2023)	Quartile
1	“Special needs financial planning a comparative perspective”	2	2	Book		
2	“Intellectual and developmental disabilities”	2	50	0.588	2.4	Q2
3	“Autism”	2	1	1.767	9.5	Q1
4	“A Spectrum of solutions for clients with Autism Treatment for adolescents and adults”	2	0	Book		
5	“Unifying educational systems leadership and policy perspectives”	1	1	Book		
6	“Research in developmental disabilities”	1	47	0.774	5.4	Q2
7	“Psychiatric services”	1	48	1.405	5.5	Q2

8	"Pediatrics"	1	14	2.864	12.4	Q1
9	"Ortho magazine"	1	0	0.100	0.0	Q4
10	"LDA journal"	1	0	0.104	0.0 (2017- Discontinued)	Q4
11	"Autism in adulthood"	1	3	3.057	9.6	Q1
12	"American journal on intellectual and developmental disabilities"	1	36	0.586	3.0	Q2
13	"BMC psychiatry"	1	51	1.291	5.7	Q2
14	"Chinese journal of disease control and prevention"	1	3	0.141	0.5	Q4
15	"Citizenship, social and economic education"	1	4	0.275	2.2	Q2
16	"Economic analysis and policy"	1	0	1.098	9.5	Q1
17	"Families, systems and health"	1	58	0.288	1.5	Q4
18	"Frontiers in psychology"	1	0	0.891	5.2	Q2
19	"The health service journal"	1	0	0.100	0.1 (2017- Discontinued)	Q4
20	"International journal of inclusive education"	1	30	0.825	7.1	Q1
21	"International journal of supply chain management"	1	1	0.190	1.0 (2019- Discontinued)	Q3
22	"Journal of Autism and developmental disorders"	1	6	1.196	7.8	Q1
23	"Journal of child and family studies"	1	16	0.918	3.4	Q2
24	"Journal of clinical medicine"	1	2	0.935	5.5	Q1
25	"Journal of consumer affairs"	1	0	0.647	4.5	Q1
26	"Journal of family and economic issues"	1	105	0.511	4.8	Q2
27	"Journal of policy analysis and management"	1	10	2.111	5.7	Q1
28	"Journal of the California Dental Association"	1	7	0.163	0.9 (2017- Discontinued)	Q3
<i>Note: Cote score 2023: Last updated on 05 January, 2024 •</i>						

### 3.2. Major Players in Research on 'Financial Issues on Special Needs Children' (RO2)

This study looked at the following in addressing the research question related to the major players.

- (i) "geographical distribution",
- (ii) "institutions involved",
- (iii) "authorship analysis", and
- (iv) "citation analysis".

### 3.2.1. Geographical Distribution

The search results indicate that a total of 12 countries have made contributions to publications on 'financial issues on special needs children'. Table 4 presents the output generated by the VOSviewer software, which provides information on the countries that have contributed to the number of documents and citations. The findings suggest that the United States significantly outperforms other countries in terms of publications and citations, accounting for 56% of the overall document count and 443 citations. China, Australia, and the United Kingdom were placed second, third, and fourth, respectively.

Remarkably, even though Denmark published only one document, however, the number of citations is quite remarkable (30 citations). One of the reasons why the U.S. studied more on the topic may be because the U.S. has a large population of individuals with autism and special needs, making it a viable location for studying these conditions. As per the Centres for Disease Control and Prevention, the rate of autism in the United States is estimated to be one in every 150 children.

It is noteworthy that the majority of the documents originated from Western countries, while only 5 out of the 32 documents were from Asian countries. This fact presents an opportunity for prospective researchers to investigate the 'financial issues on special needs children' in Asian countries.

**Table 4.**

Ranked contributing countries based on the number of documents & citations.

Rank	Country	No. of documents	Citations
1	United States	18	443
2	China	3	60
3	Australia	2	1
4	United Kingdom	2	1
5	Canada	1	3
6	Denmark	1	30
7	Fiji	1	0
8	Greece	1	2
9	Hong Kong	1	0
10	Kyrgyzstan	1	1
11	Netherlands	1	0
12	Singapore	1	2

### 3.2.2. Institutions Involved

There was a total of 69 institutes affiliated with the research documents on 'financial issues concerning children with special needs' from 1992 to 2023. Table 5 displays the 10 institutions with the highest productivity. It is worth noting that the top four institutions had only two publications each, while the other six institutions had only one publication each. The VOSviewer software classified the output according to the aggregate number of documents, aggregate citations, and aggregate link strength. The data revealed no discernible association between the quantity of documents and the total number of citations for each institution. Although the Lurie Institute for Disability Policy has the highest publication output, the amount of citations it has received is still moderate, with a total of 50. Conversely, the article titled "Financial issues associated with having a child with autism" from Washington State University and the Personal Financial Planning Department at the University of Missouri-Columbia, although not among the top 3 universities, generated the highest number of citations, with a total of 105 citations.

**Table 5.**

Top 10 institutions contributing to the publications.

Rank	Institution	Country	No. of documents	Citations
1	"Lurie Institute for Disability Policy, Heller School for Social Policy and Management, Brandeis University"	United States	2	50
2	"Cooperative Research Centre for Living with Autism (Autism CRC)"	Australia	2	1
3	"Macquarie University"	Australia	2	1
4	"University College London"	United Kingdom	2	1
5	"Department of Political Science and Criminal Justice, Washington State University"	United States	1	105
6	"Personal Financial Planning Department, University of Missouri-Columbia"	United States	1	105
7	"Center for Applied Research and Evaluation, Pediatrics, University of Arkansas for Medical Sciences"	United States	1	58
8	"College of Public Health, University of Arkansas for Medical Sciences"	United States	1	58
9	"University of Arkansas for Medical Sciences"	United States	1	58
10	"University of Mississippi Medical Center"	United States	1	58

### 3.2.3. Authorship Analysis

This study examined authorship by considering both the overall number of citations and the total number of documents. Table 6 displays the top 10 authors with the highest total citations, indicating their prolificacy. The writers who had the highest number of total citations were Sharpe and Baker (2007) with 105 citations, Saunders et al. (2015) with 58 citations, and Ou et al. (2015) with 51 citations.

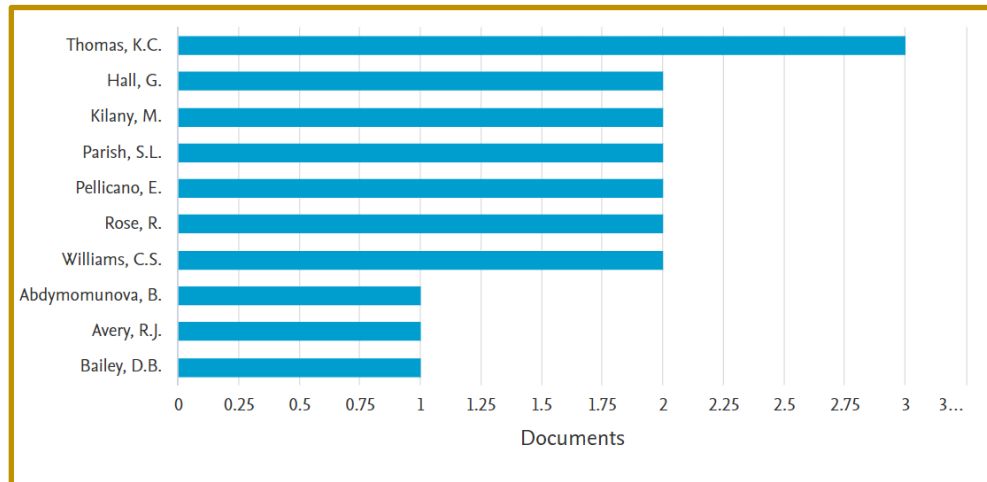
**Table 6.**

Top 10 most productive group of authors based on number of citations.

Rank	Authors	No of documents	Citations
1	"Sharpe D.L.; Baker D.L."	1	105
2	"Saunders B.S.; Mick Tilford J.; Fussell J.J.; Schulz E.G.; Casey P.H.; Kuo D.Z."	1	58
3	"Ou J.-J.; Shi L.-J.; Xun G.-L.; Chen C.; Wu R.-R.; Luo X.-R.; Zhang F.-Y.; Zhao J.-P."	1	51
4	"Zablotsky B.; Kalb L.G.; Freedman B.; Vasa R.; Stuart E.A."	1	48
5	"Ouyang L.; Grosse S.D.; Riley C.; Bolen J.; Bishop E.; Raspa M.; Bailey D.B."	1	47
6	"Parish S.L.; Thomas K.C.; Williams C.S.; Crossman M.K."	1	36
7	"Meijer C.J.W.; Watkins A."	1	30
8	"Parish S.L.; Thomas K.C.; Rose R.; Kilany M.; Shattuck P.T."	1	25

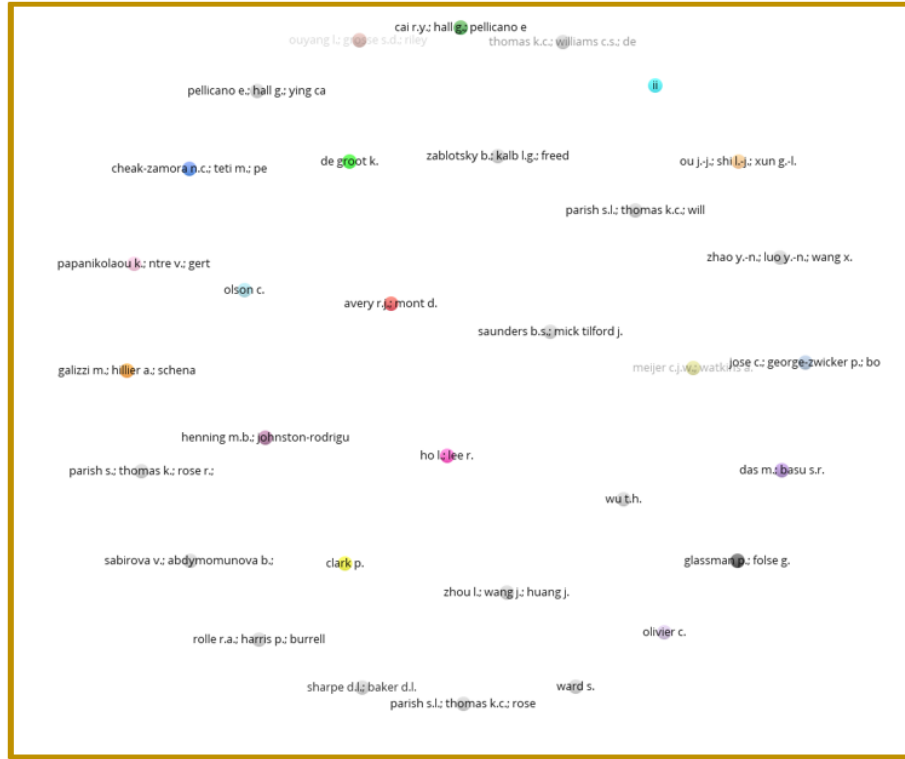
9	“Parish S.; Thomas K.; Rose R.; Kilany M.; McConville R.”	1	25
10	“Cheak-Zamora N.C.; Teti M.; Peters C.; Maurer-Batjer A.”	1	16

Further, Figure 5 displays the names of the top ten authors and their corresponding documents. Thomas, K.C. is the most productive author, having authored three (3) articles. Hall, G., Kilany, M., Parish, S.L., Pellicano, E., Rose, R., and Williams, C.S. were ranked as the second-highest, with each of them having 2 documents. The remaining authors have each written a solitary piece about the research on financial issues involving special needs children.



**Figure 5.**  
Document by author.

Remarkably, unlike most research on other topics, there is a co-authorship network. The co-authorship network identifies the most productive authors in the field of research and illustrates the co-authorship link among the authors. However, there is no co-authorship network for research on ‘financial issues on special needs children’ (see Figure 6).



**Figure 6.**  
The co-occurrence knowledge map of authors.

### 3.2.4. Citation Analysis

In this study, a citation analysis was conducted on renowned and high-quality publications. The number of citations received by a scientific work is considered a crucial determinant of its overall quality (Mukherjee et al., 2021). One way to gain insight into the research trends in the scientific field is by examining highly cited works (Gao et al., 2022). The software, Publish or Perish, developed by Harzing, was employed to compute the citation metric for the gathered data. Table 7 presents the citation metric for all publications that were retrieved, as of February 3rd, 2024. The citation metrics table reveals that 495 citations were utilised to reference 32 published works over 32 years (1992–2024), resulting in an average of 15.47 citations per year.

**Table 7.**  
Citation metrics.

Reference date	3 <sup>rd</sup> February 2024
Publication years	1992–2023
Citation years	32 (1992–2024)
Total number of papers	32
Total citations	495
Cites/year	15.47
Cites/paper	15.47
Cites/author	142.78
Authors/paper	3.56
Papers/author	13.48
Hirsch h-index	11
Egghe g-index	22

PoP hI,norm	6
PoP hI,annual	0.19

Further, Table 8 displays the ten documents that have received the highest number of citations. The table presents a summary of the citation frequency for each document in the Scopus and Google Scholar databases, together with the annual citation count. The article authored by Sharpe and Baker (2007) has the highest number of citations, making it the most frequently referenced document. This study evaluated the factors linked to financial difficulties in families that have a kid diagnosed with autism. The probability of experiencing financial difficulties was found to be strongly correlated with the utilisation of medical interventions, the presence of unreimbursed medical or therapeutic costs, and a comparatively lower income level. Sharpe and Baker demonstrated that individuals willingly sacrificed their future financial stability and even faced bankruptcy to provide necessary therapy for a child diagnosed with autism. This document has an average citation per year of 6.18, as reported by the Scopus Database. According to the calculations made by Google Scholar, the articles have received a total of 300 citations, with an average of 17.65 citations per year.

**Table 8.**

All articles on 'financial issues on special needs children'.

No	Authors	Year	Document Title	Source	Cited by	Cites per year	GS cites	GS cites per year
1	Sharpe & Baker	2007	"Financial issues associated with having a child with autism"	"Journal of Family and Economic Issues"	105	6.18	300	17.65
2	Saunders et al.	2015	"Financial and employment impact of intellectual disability on families of children with autism"	"Families, Systems and Health"	58	6.44	149	16.56
3	Ou et al.	2015	"Employment and financial burden of families with preschool children diagnosed with autism spectrum disorders in urban China: Results from a descriptive study"	"BMC Psychiatry"	51	5.67	89	9.89
4	Zablotsky et al.	2014	"Health care experiences and perceived financial impact among families of children with an autism spectrum disorder"	"Psychiatric Services"	48	4.8	92	9.20
5	Ouyang et al.	2014	"A comparison of family financial and employment impacts of fragile X syndrome, autism spectrum disorders, and intellectual disability"	"Research in Developmental Disabilities"	47	4.7	92	9.20
6	Parish, Thomas, Williams & Crossman	2015	"Autism and families' financial burden: The association with health insurance coverage"	"American Journal on Intellectual and Developmental Disabilities"	36	4	92	10.22
7	Meijer & Watkins	2019	"Financing special needs and inclusive education—from Salamanca to the present"	"International Journal of Inclusive Education"	30	6	82	16.40
8	Parish et al.	2012	"State medicaid spending and financial burden of families raising children with autism"	"Intellectual and Developmental Disabilities"	25	2.08	55	4.58
9	Parish et al.	2012	"State insurance parity legislation for autism services and family financial burden"	"Intellectual and Developmental Disabilities"	25	2.08	51	4.25
10	Cheak-Zamora et al.	2017	"Financial Capabilities Among Youth with Autism Spectrum Disorder"	"Journal of Child and Family Studies"	16	2.29	42	6.00
11	Thomas et al.	2016	"Examination of parent insurance ratings, child expenditures, and financial burden among children with Autism: A mismatch suggests new hypotheses to test"	"Pediatrics"	14	1.75	31	3.88

12	Avery & Mont	1992	“Financial support of children involved in special needs adoption: A policy evaluation”	“Journal of Policy Analysis and Management”	10	0.31	24	0.75
13	Glassman & Folse	2005	“Financing oral health services for people with special needs: projecting national expenditures”	“Journal of the California dental association”	7	0.37	12	0.63
14	Zhou, Wang, &Huang	2022	“Brief report: Health expenditures for children with Autism and family financial well-being in China”	“Journal of Autism and developmental disorders”	6	3	9	4.50
15	Henning & Johnston-Rodriguez	2018	“Evaluating financial literacy curriculum for young adults with special needs: A review of content, universal design for learning, and culturally responsive curriculum principles”	“Citizenship, social and economics education”	4	0.67	14	2.33
16	Jose et al.	2021	“The associations between clinical, social, financial factors and unmet needs of Autistic adults: Results from an observational study”	“Autism in Adulthood”	3	1	4	1.33
17	Zhao et al.	2023	“Research on the direct financial burden on families with 2-6 years old children having autism spectrum disorder in China”	“Chinese journal of disease control and prevention”	3	1	3	1.00
18	Papanikolaou et al.	2022	“Parenting children with autism spectrum disorder during crises: Differential responses between the financial and the COVID-19 pandemic crisis”	“Journal of clinical medicine”	2	1	8	4.00
19	Wu	2019	“Financial planning mechanisms available to persons with special needs in Singapore”	“Special needs financial planning: A comparative perspective”	2	0.4	1	0.20
20	Cai, Hall, & Pellicano	2023	“Predicting the financial wellbeing of autistic adults: Part I”	“Autism”	1	1	1	1.00
21	Sabirova et al.	2018	“Supply chain financing for supporting the children with special needs: Problem-solving strategies”	“International Journal of Supply Chain Management”	1	0.17	7	1.17
22	Rolle, Harris, & Burrello	2012	“In support of a seamless special needs students services system: A heuristic examination of education finance policy, special needs revenue components, and flexible expenditure possibilities”	“Unifying Educational Systems: Leadership and Policy Perspectives”	1	0.08	1	0.08
23	Ho & Lee	2019	“Special needs financial planning”	“Special needs financial planning: A comparative perspective”	0	0	0	0.00
24	Ward	2003	“Finance. Special needs”	“The health service journal”	0	0	0	0.00

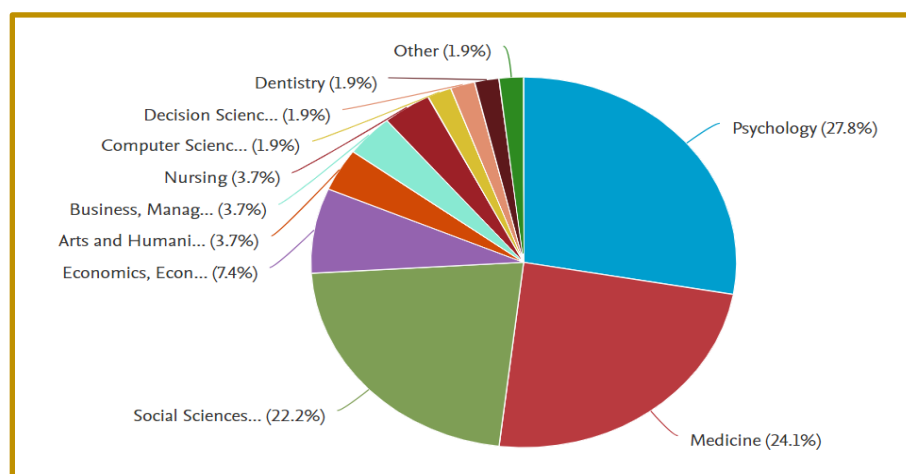
25		2016	“Autism: An instruction on the financing of liberal interventions”	“Ortho Magazine”	0	0	0	0.00
26	Olivier	2013	“Financial planning for special needs children”	“LDA journal”	0	0	0	0.00
28	De Groot	2020	“Non-clinical autistic traits correlate with social and ethical but not with financial and recreational risk-taking”	“Frontiers in psychology”	0	0	2	0.50
29	Galizzi, Hillier, & Schena	2023	“Financial literacy among autistic adults”	“Journal of Consumer Affairs”	0	0	0	0.00
30	Clark	2020	“Financial planning for families with children with autism”	“A spectrum of solutions for clients with Autism: treatment for adolescents and adults”	0	0	0	0.00
31	Das & Basu	2023	“Inclusive bank based financial development in countries with special needs: A semiparametric analysis”	“Economic analysis and policy”	0	0	2	2.00
32	Pellicano, Hall, & Ying Cai	2023	“Autistic adults’ experiences of financial wellbeing: Part II”	“Autism”	0	0	1	1.00

### 3.3. Mapping (RO3)

This part presents analyses on (i) “Research Domain” and (ii) “Keyword Analysis.”

#### 3.3.1. Research Domain (Subject Area)

Figure 7 illustrates the specific areas of study that are addressed in the research on financial matters related to children with special needs. Over 74.1% of the documents obtained were from the domains of "Psychology", "Social Sciences", and "Medicine", with each subject contributing more than 20%. The remaining domains constituted less than 30% of the documents. Despite its relevance to management or finance, a considerable amount of research falls within the realm of "Psychology". Topics about autism are inherently linked to psychology, irrespective of any associated concerns, making it a logical connection.



**Figure 7.**  
Research domain.

#### 3.3.2. Keyword Analysis

Keywords facilitate the focus and purification of the main subject matter and the significance of the literature in the research domain (Nawi et al., 2023). Figures 8 and 9 display the visual representation of the keyword developed by VOSviewer, displaying the strength of the connection between keywords.

The authors Sweileh et al. (2017) observed that similar terms are usually presented in the same colour. Figure 8 visually represents the keyword map by considering the co-occurrence of all keywords. By default, this study established the minimum threshold for keyword occurrences as one (1). Based on statistics provided by VOSviewer, the authors used a total of 232 keywords in 32 papers. Following the completion of the cleaning procedure, a total of 173 keywords out of the initial 232 (with 12 clusters) met the minimum requirement.

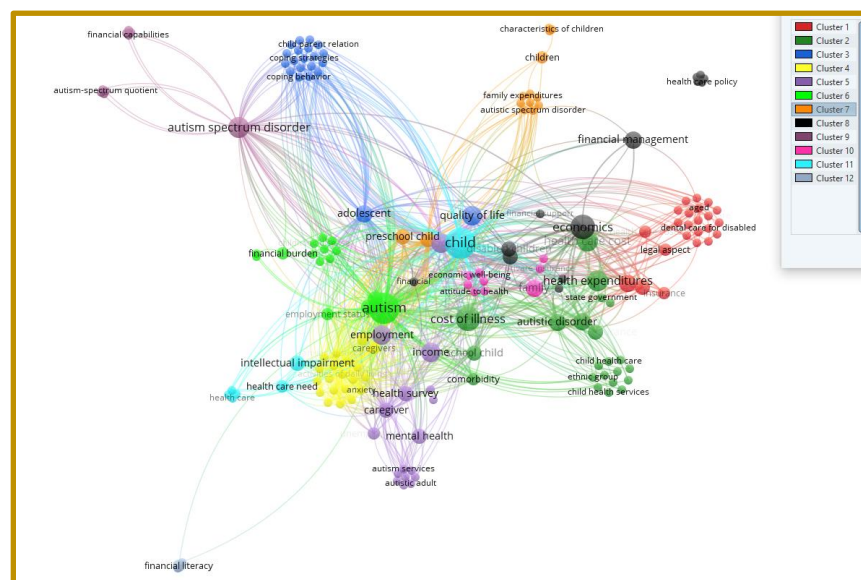
Referring to Figure 8, different colours of keywords represent different clusters. Cluster 1 (**red network**) consists of 23 keywords such as dental care, insurance, legal aspect, aged, poverty, preventive dentistry, hospital charge, medicaid, vulnerable population, etc. The most frequent keyword in the red cluster is insurance.

Cluster 2 (**dark green network**) includes 22 keywords; autistic disorder, child health care, cost of illness, health care cost, hispanic, etc. Cost of illness and health care cost are frequently used keywords in this cluster. Cluster 3 (**dark blue network**) comprises 21 keywords concentrating on adolescents, quality of life, coping behaviour, child-parent relation, parental stress, social support, financial crisis-oriented, etc. This Cluster 3 focuses on life, support and behaviour.

Additionally, Cluster 4 (**yellow network**) has 20 keywords focused on anxiety, family assessment, caregiver, intellectual disability, irritability, etc. Cluster 5 (**purple network**) with 17 items

concentrates on adults, autism services, mental health, income, health survey, social work, unmet service needs, etc. Moreover, Cluster 6 (**light green**) consists of 15 keywords and Cluster 7 (**orange network**) consists of 14 keywords; where the former focuses on autism, child care, childhood disease, financial burden, employment burden, etc., and the latter concentrates on the preschool child, family expenditure, characteristics of children, etc.

Alternatively, Cluster 8 (black network) connects 13 keywords such as health care policy, financial management, specialities, state medicine, economics, etc. Both Cluster 9 (**brown network**) and Cluster 10 (pink network) connect 9 keywords each. For instance, uncertainty, risk, financial capabilities, independence, and money management in Cluster 9 and attitude to health, economic well-being, family, financial well-being, out-of-pocket spending, and socioeconomic in Cluster 10. The remaining clusters, Cluster 11 (**cyan network**) and Cluster 12 (**grey network**) consist of seven (7) and three (3) keywords, respectively. The most collaborative keywords in Cluster 11 are child, healthcare need, health care quality, intellectual impairment, medical care, etc. Alternatively, the keywords for Cluster 12 are disability, financial literacy and student with disabilities.



**Figure 8.**  
Keyword map (Based on co-occurrence of all keywords).

Further analysis extended it to incorporate the overlay visualisation, exhibiting the evolution of the research across time. This was done to enhance the visual attractiveness of the representation (see Figure 9). Given the limited 32 documents, this study established a minimum threshold of 1 occurrence for a keyword. The predominant terms in this area of research were "autism", "economics", and "child". The map uses a blue-to-cyan colour range to represent research activities published between 2005 and 2010. On the other hand, keywords with green-yellow-red colour ranges represent phrases used in more recent publications (2010 to present). Notable current keywords include financial well-being, coping behaviour, autism spectrum quotient, attitude towards health, mental health, financial literacy, and quality of life.



special needs children'. Therefore, any publications published in specialised journals focusing on the financial aspects of special needs children with lower rankings were ignored. Readers should take into account these limitations when assessing the generalizability of the findings in this study.

Despite these limitations, this study makes a valuable contribution to the literature by providing a systematic overview of the research on financial issues among special needs children. The findings can inform future research directions and policy initiatives aimed at supporting these families and promoting their financial well-being. The study also highlights the importance of bibliometric analysis as a tool for mapping and evaluating research trends and gaps in this field. Researchers and practitioners can use this analysis as a starting point for further investigations and collaborations to address the financial challenges faced by families with special needs children.

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