RESEARCH ARTICLE

Social Interaction Skills Collaboration Model of Autism Spectrum Disorder: Bibliometric Analysis in Publication 2013-2023

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Abstract
This study aims to determine the development of scientific publication trends related to collaboration models on social interaction skills of children with autism spectrum disorders in the range of 2013 - 2023 in Crossref, PubMed and Scopus indexed scientific publications. This research focused on the following questions: (1) how is the productivity of publications? (2) what thematic areas are of most interest to academics? (3) future study opportunities that still need further research. This research uses a bibliometric analysis approach. The visualization process is supported using VOSviewer software. There are 1000 scientific publication articles in the range of 2013 - 2023. Scientific publications are dominated in the form of: (1) book; (2) book chapter; (3) journal article; (4) posted content and (5) proceedings. In the keyword density visualization section, it is presented into 6 clusters, namely: (1) asd; (2) child; (3) behavior; (4) autism spectrum disorder; (5) adult and (6) adolescent. Mapping related to the development of publication trends provides information for future study opportunities that are still rarely carried out further research such as: (1) social support, (2) life satisfaction, (3) pcit (parent child interaction therapy), (4) role, (5) differential diagnosis and (6) neurodevelopmental disorder.

Keywords
Autism Spectrum Disorder, Bibliometric, Model, Social Interaction Skill

INTRODUCTION

The ideal timeframe for child growth and development is determined by a multitude of factors, encompassing both internal and external influences. This intricate process renders children susceptible to a variety of health issues that may arise during their growth journey. One of these is the appearance of neurological problems in the brain, which cause the development of interaction, communication, and behaviour to be hampered. This condition is known as autism spectrum disorder (ASD) (Hernawan et al., 2018). Autism is a neurodevelopmental disorder characterized by difficulties in processing information, particularly in the areas of language comprehension, communication, and sensory integration. People with autism often struggle to understand and express themselves using verbal and non-verbal communication. In addition, they may face challenges in organizing and processing auditory and visual stimuli, which can affect their ability to learn and engage with the world around them effectively. Individuals with autism commonly exhibit repetitive motor (Siegel, 1996) The causes of ASD are multifactorial, i.e. the presence of genetic factors and the presence of influential environmental factors (Article Ganaie & Ganaie, 2014). It is an early childhood issue that has a substantial impact on social interaction, communication skills, and behaviour development. The disorder, which creates stereotyped habits, interests, and activities, frequently manifests itself before reaching the age of 3 (American Psychiatric Association, 2013). The disease impairs an individual's ability to engage with others in socially

acceptable ways. People with autism spectrum disorder (ASD) face both direct and indirect social interaction challenges. Socialisation issues, regardless of cognitive or language abilities, are a key source of impairment for individual (Volkmar et al., 2015). People with ASD struggle with a variety of different social issues, such as relationships with other people, language standards, and communication (Ranjan et al., 2022). Autistic people have an array of signs and symptoms, the degree of severity, cognitive decline, and clinical issues (López & Lópe, 2016). Adolescents with ASD face a variety of social challenges, involving issues with speaking, language standards, and interactions with others (Ranjan et al., 2022). Individuals with ASD have difficulty developing appropriate social skills and may miss out on opportunities for good peer interactions; group training is a viable remedy (Ranjan et al., 2022). Furthermore, considering the growing recognition of ASD in infants with typical cognitive skills (Croen et al., 2002). Children diagnosed with ASD exhibit the ability to read words, although they may encounter challenges in direct verbal communication with their peers. Some common difficulties include a limited capacity to respond when called by their name, a lack of eye contact or gestures, an inability to spontaneously smile at others, and a tendency to not say goodbye unless prompted to do so. These communication hurdles can be observed in children with ASD, highlighting the unique social and linguistic characteristics associated with this disorder.

Scientific publications related to ASDP The publication of scientific articles has historically been the main means of communication for researchers and academics (Cho, 2017). An approach that can be used to measure the quality of scientific publications and also to evaluate them can be done with bibliometric methods (Ibrahim, 2019). Bibliometrics is a quantitative analysis of written documents, these documents are scientific publications. The use of bibliometric analysis can assist in providing an overview of the research field and relationships with other studies. Bibliometrics can represent the quality of a study through the type of research, distribution of research results, statistical analysis of total research results, and others. The statistical examination of books, journals, scientific publications, and authors is known as bibliometrics. The basic and first metrics for such statistical analysis include word frequency analysis, citation analysis, or the number of author publications. Bibliometric indicators are calculated over time (often 3-5 years) and generally employ two approaches: the number of publications, which reflects production, and the number of citations, which measures the effect of the articles generated (Devos, 2011). In some countries, for example the UK, bibliometrics is used as an acceptable and valid measure of research quality (Adams, 2009). This is because bibliometric analysis is comprehensive across science, engineering, technology and mathematics disciplines and all higher education institutions. Furthermore, it is known to be robust and reliable when applied at the level of broad groups of research fields, and is able (at a broad level of aggregation) to identify high quality research. At the global level, this kind of research has been commonly conducted such as the recent trends in global scientific publications (Kim et al., 2018). Kim et al., (2018) in their study reviewed the presentation of recent trends in innovative global scientific journal distribution and publication platforms, with implications for local journals.

Bibliometric analysis can be done with the help of VOSviewer software. VOSviewer is programme that allows you to create maps based on network data and then visualise and explore them. The algorithm system run in this program is similar to Multi Dimentional Scaling (MDS). VOSviewer's clusters are automatically coloured and presented on the map. The clustering algorithm employs a parameter that can be adjusted to produce more or fewer clusters. VOSviewer can display cluster density and colour (Leydesdorff & Rafols, 2012). The programme combines text mining capabilities to discover noun phrase combinations relevant to the mapping and an integrated clustering approach to investigate data co-citation and co-occurrence networks, which gives VOSViewer an advantage over other analysis software (van Eck & Waltman, 2009). Although there are many programs for analyzing text units and similarity matrices, the advantage of VOSviewer is in its visualization.

MATERIALS AND METHODS

To obtain metadata in this study, researchers used phrases in the Crossref, PubMed and Scopus databases in the 2013–2023 time span on August 31, 2023. Based on the thawing, 1000 indexed publications were obtained. The data analysis procedure is shown in Figure 1.
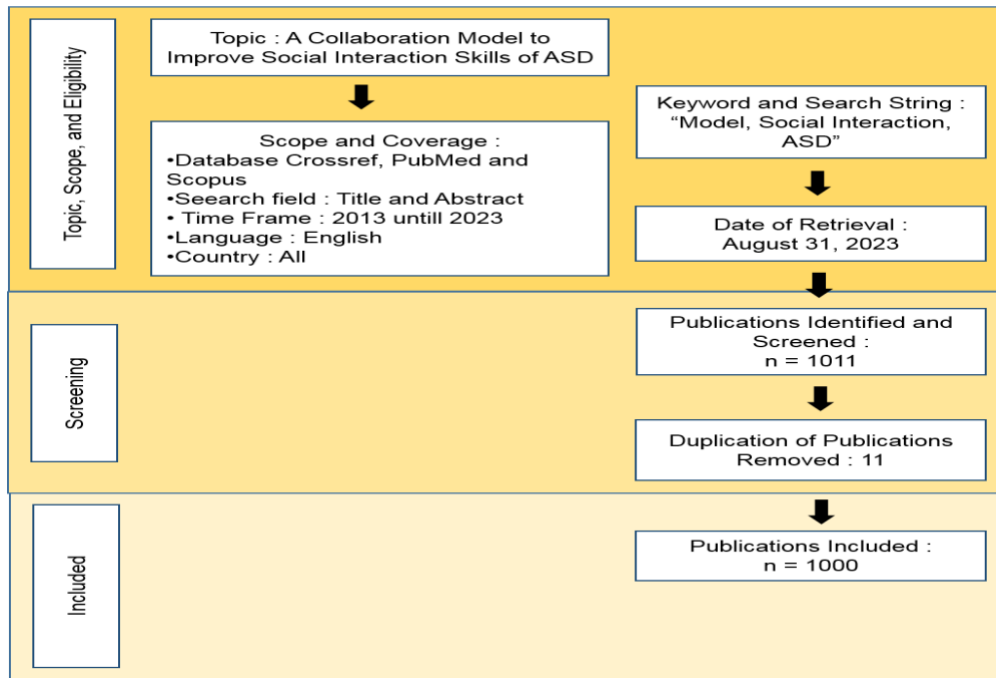
Figure 1. Article metadata search design

In this study, bibliometric analysis is used, bibliometric analysis is used through publication mapping and keyword co-occurrence analysis, a type of shared word analysis (Donthu et al., 2021). The application of keyword co-occurrence analysis is carried out to find publication trends and track themes or topics that appear in a publication using predetermined keywords. This study analyzed the number of documents in terms of document type and language, publication trends in the keywords "model, social interaction, ASD" from 2013 to 2023, and the top 10 citations. In presenting the data visualization, the researcher was assisted by using VOSviewer software previously developed at Leiden University. The parameters in the VOSviewer software used by researchers are presented in Table 1.

Table 1. VOSviewer parameters were employed in the analysis

Item	Characteristic/Value
	Co-occurrence analysis, co-occurrence maps by on text data
Type of analysis	
Unit of analysis	All Keywords
Counting method	Full counting
Layout:	
Attraction	2 (default setting)
Repulsion	0 (default setting)
Clustering	
Resolution parameter (detail of clustering)	1 (default setting)
Minimum cluster size [N]	1 (default setting)
Visualization:	
Scale	1.00
Weights	Occurrences
Labels size	0.50
Maximum number of lines	1000

Source: Researcher Data

RESULTS

Scientific publications play a crucial role in enhancing research quality and providing guidance to researchers in academia. It is essential to explore the progress and themes of research on collaboration models to enhance social interaction skills in children displaying symptoms of autism spectrum disorder (ASD). To achieve this, bibliometric analysis was employed in this study to examine the development and trends of research in collaboration models aiming to improve social interaction skills in individuals with ASD. According to Siegel, one of the academics who wrote about autism, autism classified as a processing disorder, hinders an individual's ability to comprehend and utilize language effectively, as well as organize information received through hearing and sight, this condition is often accompanied by repetitive physical movements, a strong inclination towards adhering to routines and maintaining uniformity, and exceedingly limited social skills (Siegel, 1996). Primarily observed in childhood, autism significantly impacts the development of crucial aspects such as social interaction, communication proficiency, and behavioral patterns (American Psychiatric Association, 2013). People with autism tend to exhibit fixed and repetitive habits, interests, and activities. Moreover, their capability to engage with others in socially acceptable manners becomes compromised due to the challenges they face in social interaction (Volkmar et al., 2015). It is important to note that such difficulties in social interaction have both direct and indirect repercussions for individuals diagnosed with autism spectrum disorder (ASD). Socialization difficulties pose a significant hindrance for individuals with ASD, irrespective of their cognitive or language abilities. To accurately evaluate the caliber of a study, the implementation of bibliometric analysis proves invaluable. This analytical approach not only gauges the quality of research but also explores facets such as research type, dissemination of findings, statistical scrutiny of collective research outcomes, and more. Bibliometrics, encompassing the statistical assessment of books, journals, scientific articles, and authors, serves as a valuable tool in this process. Metrics such as word frequency analysis, citation analysis, and the quantification of author articles form the foundational bedrock for conducting a comprehensive statistical analysis in this field.

In this study, researchers focus on analyzing the variables of model, social interaction, and autism spectrum disorder. These variables serve as the key factors for conducting a bibliometric analysis. Using VOSviewer visualization, it is evident that the keywords "model," "social interaction," and "autism spectrum disorder" are closely interconnected. This visualization highlights the fact that these specific keywords are significant components that have been extensively explored and discussed in various scientific publications. Therefore, researchers want to analyze scientific publications with the keyword's "model", "social interaction", and "autism spectrum disorder" in the range of 2013 to 2023 indexed by Crossref, PubMed and Scopus. The focus of researchers in this article are: (1) how is the productivity of publications with the keywords "model, social interaction, ASD", (2) what thematic areas are most interested by academics with the keywords "model, social interaction, ASD", and (3) future study opportunities with the keywords "model, social interaction, ASD". In searching for scientific publications, researchers are assisted by using Publish or Perish software. The results of the analysis obtained 1000 scientific publications which were then further analyzed to produce visualizations with the help of VOSviewer software.

The Development of Publication with keywords "model, social interaction, ASD"

The development of scientific publications using the keywords "model, social interaction, ASD" from 2013 to 2023 recorded 1000 scientific publications. The keywords model, social interaction and ASD are interrelated keywords seen from the results of VOSviewer visualization, the results of VOSviewer visualization of the relationship between these keywords can be seen in Figure 2.
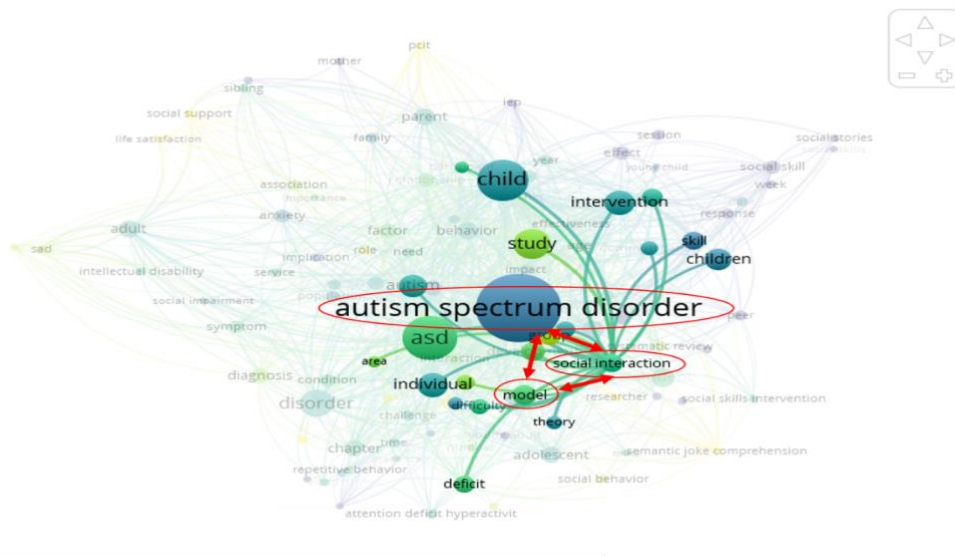
Figure 2. The connection between the keywords model, ASD and social interaction

Based on Figure 2, it can be seen that the keyword with the largest circle, namely "autism spectrum disorder" is the keyword that appears the most of all existing keywords. That has meaning that the model related to social interaction in autism spectrum disorder is a research object in the range of 2013 to 2023 Data on the development of publications with the keywords "model, social interaction, ASD" is shown in Figure.
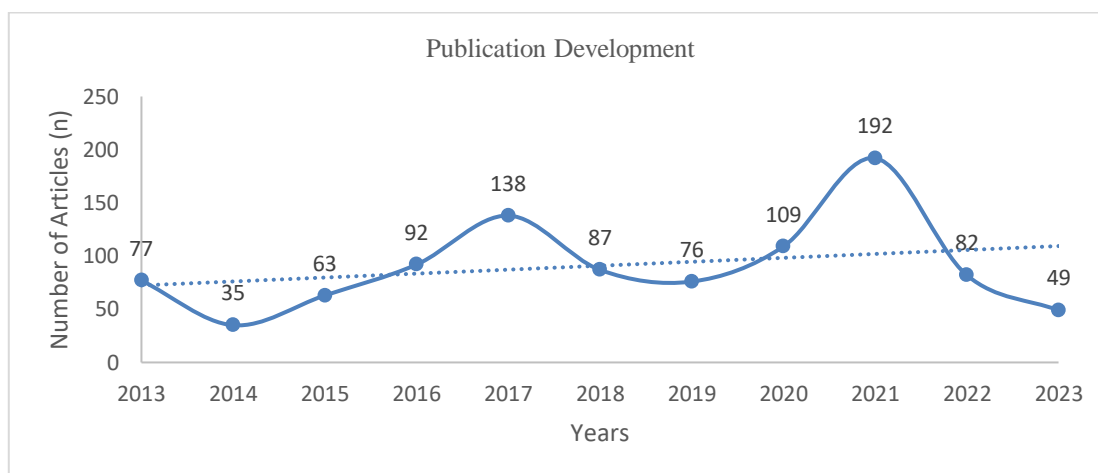

Figure 3. The publication development with keyword "model, social interaction, ASD" from 2013 to 2023

The development of scientific publications with the keywords "model, social interaction, ASD" from 2013 to 2023 experienced changes in the number of publications each year. In 2013 there were 77 scientific article publications, in 2014 there were 35 scientific article publications, then experienced an increase from 2015 to 2017, with 138 scientific article publications in 2017. In 2018 it decreased to 87 publications of scientific articles, in 2019 there were 76 publications. Publications increased again in 2020 and 2021, with the highest number of publications in the last 10 years occurring in 2021 with 192 publications of

scientific articles. In 2021, there was a significant increase in the publication of scientific articles with the keywords "model, social interaction, ASD", this condition is possible because 2021 is the Covid-19 pandemic period, where all activities in various fields are affected, including in the field of education. Many academics are trying to analyze the best learning model so that learning continues during social distancing and almost all activities are carried out online. This condition resulted in the publication of many scientific articles related to learning models. The number of publications decreased in 2022 with 82 publications, and finally

in 2023 there were 49 publications of scientific articles. Of the 1000 scientific publications analyzed, there are several types of research designs used. The types of scientific publications with the keywords "model, social interaction, ASD" are shown in Figure 4.
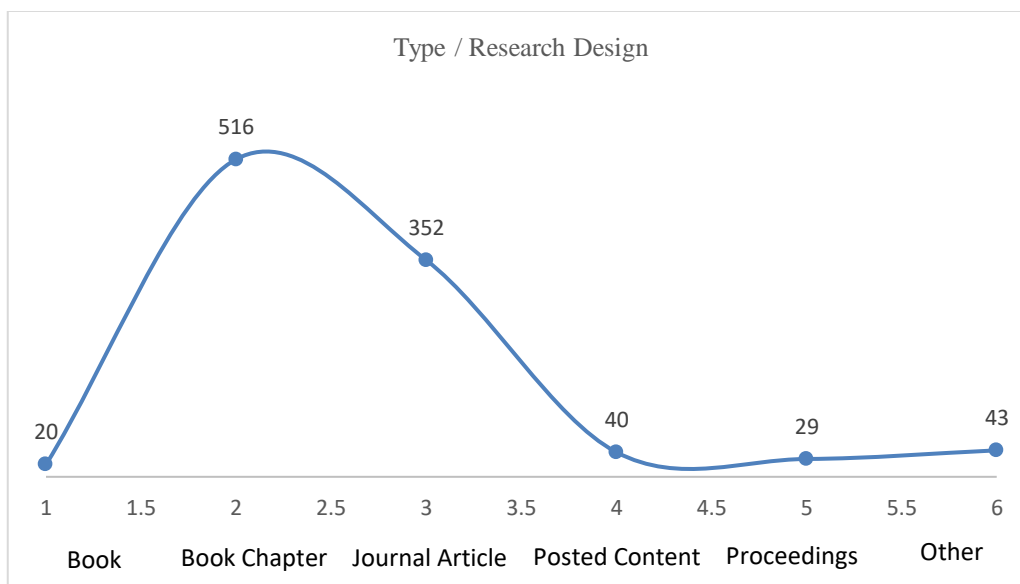

Figure 4. Type/ research design with keyword "model, social interaction, ASD" from 2013 to 2023

There are several types of publications from 1000 scientific publications indexed in the Crossref, PubMed and Scopus databases in the 2013 - 2023 timeframe. There are 20 books, 516 with the type of book chapter and being the most types of publications, 352 journal articles, 40 posted content, 29 in the form of proceedings and 43 others which are divided into 6 data sets, 1 edited book, 1 monograph, 11 peer reviews and 6 reports.

Thematic Trends on Scientific Publications with Keywords "model, social interaction, ASD"

Based on the keyword co-occurrence analysis on 1000 scientific publications, 102 keywords were found and resulted in 6 clusters that appeared from the visualization results of the VOSviewer software. These clusters form a thematic and intersect with other clusters. Cluster 1 (red) related to ASD, cluster 2 (green) related to child, cluster 3 (dark blue) related to behavior, cluster 4 (yellow) related to autism spectrum disorder, cluster 5 (purple) related to adult and finally cluster 6 (light blue) related to adolescent. More detailed occurrences of shared keywords are shown in Table 2.

Table 2. High-Frequency Keyword Group

Cluster	Number of Keywords (items)	Keyword
Cluster 1/ ASD	36	(1) Abstract, (2) adhd, (3) area, (4) asd, (5) attention deficit hyperactivity disorder, (6) autism, (7) autism spectrum, (8) chalenge, (9) time (10) chapter, (11) characteristic, (12) condition, (13) deficit, (14) development, (15) diagnosis, (16) difference, (17) differential diagnosis, (18) difficulty, (19) disorder, (20) dsm, (21) emotion dysregulation, (22) individual, (23) interaction, (24) interest, (25) life, (26) model, (27) mouse model, (28) neurodevelopmental disorder, (29) number, (30) person, (31) presence, (32) prevalence, (33) repetitive behavior, (34) social behavior, (35) social communication, (36) social interaction.
Cluster 2/ child	18	(1) Children, (2) communication, (3) data, (4) effect, (5) effectiveness, (6) iep, (7) intervention, (8) peer, (9) program, (10) response, (11) session, (12) skil, (13) social skill, (15) social stories, (16) teacher, (17) treatment, (18) young child

Cluster behavior	3/	19	(1) Anxiety, (2) association, (3) depressive symptom, (4) evidence, (5) factor, (6) family, (7) implication, (8) importance, (9) life satisfaction, (10) mother, (11) need, (12) parent, (13) pcit, (14) population, (15) quality, (16) relationship, (17) role, (18) sibling, (19) social support
Cluster autism spectrum disorder	4/	15	(1) Assessment, (2) impact, (3) practice, (4) research, (5) researcher (6) review, (7) school, (8) socail, (9) social cognition, (10) social skill intervention, (11) student, (12) study, (13) systematic review, (14) young adult, (15) youth
Cluster 5/ adult		8	(1) Autistic adult, (2) intellectual disabilty, (3) participant, (4) sad, (5) service, (6) social impairment, (7) symptom, (8) use
Cluster adolescent	6/	6	(1) Ability, (2) age, (3) group, (4) mind, (5) semantic joke comprehension, (6) theory

Based on the visualization shown in Figure 5, there are 6 clusters with different colors that become thematic trends in scientific publications, this analysis uses the occurrence of shared keywords. The first cluster (red circle) is more dominant to ASD. ASD refers to autism spectrum disorder, ASD is an autistic spectrum disorder or a group of conditions, some more severe than others, that are also known as autism and influence the growth of interpersonal and communication abilities, as well as an individual's behaviours and passions. The keyword of ASD associated with 36 other keywords similar to what is shown in Table 2.

In the 2nd cluster (green color circle) is more dominant to child. A child is a boy or girl during birth until reached the age of adulthood, or a son or daughter of any age. In accordance with theory, autism spectrum disorder symptoms are childhood symptoms that have a substantial influence on interpersonal relationships and communication development and usually appear before the age of three (American Psychiatric Association, 2013).

The visualization of the co-occurrence network of high frequency keywords with the keywords "model, social interaction, ASD" is shown in Figure 5.
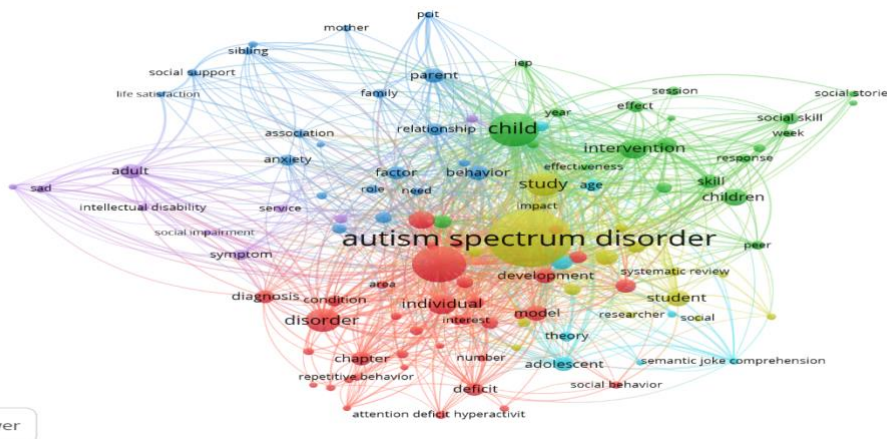
Figure 5. Visualization of high-frequency keyword co-occurrence network with keywords "model, social interaction, ASD"

other keywords similar to what is shown in Table 2. In the 2nd cluster (green color circle) is more dominant to child. A child is a boy or girl during birth until reached the age of adulthood, or a son or daughter of any age. In accordance with theory, autism spectrum disorder symptoms are childhood symptoms that have a substantial influence on interpersonal relationships and communication development and usually appear before the age of three (American Psychiatric Association, 2013). Based on Tabel 2, the keyword of child associated with 18 other keywords. In cluster 3 (dark blue

circle), behavior is dominant. Behavior is the way that someone behaves. Autism-related symptoms are very closely related to behavior, based on the theory put forward by the American Psychiatric Association (APA) autism symptoms are closely related to the development of social interaction, communication skills, and behavior (American Psychiatric Association, 2013). The behavior of children with autism symptoms is very different from children in general who are the same age. The keyword of behavior associated with 19 other keywords. In the 4th cluster (yellow circle) is dominant to autism spectrum disorder. This keyword appeared twice and became a thematic trend based on the visualization of VOSviewer software. The keyword autism spectrum disorder is the keyword with the largest keyword circle, thus concluding that the keyword autism spectrum disorder is the keyword that appears most used in scientific publications in the range 2013 to 2023 in the discussion of this article. autism is a behavioral symptom in children that is often encountered, and this condition is indeed interesting for academics to conduct further research. Autism spectrum disorder symptoms impair a person's ability to interact socially with others. People with Autism Spectrum Disorder (ASD) face both direct and indirect consequences due to difficulty with social contact. Socialisation issues, regardless of cognitive or language abilities, are a key source of disability for people with ASD (Volkmar et al., 2015). The keyword of autism spectrum disorder associated with 15 other keywords. The last cluster (light blue circle) is dominated by the keyword adolescent. Adolescent is a young person who is developing into an adult. It is undeniable that the symptoms of autism spectrum disorder are closely related to adolescence. although the initial symptoms in autism spectrum disorder mostly begin at the age of under three years, many people only realize when the child grows up. In accordance with the theory expressed by (World Health Organization) WHO that they will be very weak when interacting socially with the community. Adolescence is the age when a child must interact socially with their peers or society in a broad sense someone with autism spectrum disorder symptoms will find it difficult to develop their social skills, joining a group can be the best solution to train their social skills (Ranjan et al., 2022).The keyword of adolescent associated with 6 other keywords. Keywords that are connected to cluster keywords, are keywords that appear together in a scientific publication, which indicates that these interrelated keywords become variables in the study. by looking at the keyword co-occurence can provide valuable information for researchers or academics. researchers can conduct further analysis of the keywords visualized by VOSviewer.

Publication Opportunities with Keywords "model, social interaction, ASD"

To provide an overview of opportunities for future research themes, the researcher conducted an analysis with the help of VOSviewer software to produce a visualization of color differences that indicate old and new research themes. The visualization for future research is shown in Figure 6.
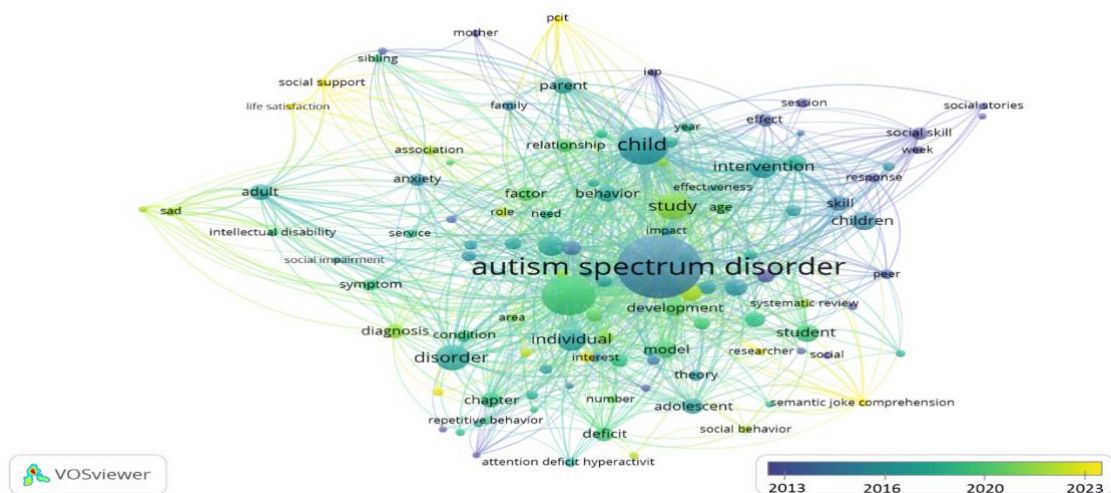

Figure 6. Analysis of Future Research Possibilities Using Overlay Visualisation

Based on the visualization results in Figure 6, there are at least 3 different colors for each keyword. The different colors on the keywords indicate different meanings. The purple color indicates scientific publications with a longer time, the change in the transition of green to yellow indicates newer scientific publications. This color-coding helps highlight the progression and relevance of research trends over time, making it easier to identify emerging areas of interest. Additionally, the visualization provides insight into shifts in focus, indicating how certain keywords have evolved or remained consistent across various publication periods.

DISCUSSION

This analysis aims to gain a deeper understanding of the development of collaborative models in improving social interaction skills in individuals with Autism Spectrum Disorder (ASD) over the past decade. Based on bibliometrics, there has been an increase in publications discussing this topic, with a peak occurring during the COVID-19 pandemic. Research on social intervention models in ASD has been highlighted due to the need to adapt education and therapy centered on social interaction in online environments. This shows the importance of developing effective social intervention methods to support the development of social skills in individuals with ASD, both inside and outside the context of formal education.

Findings from the VOSviewer visualization indicate that the keywords "model", "social interaction", and "ASD" are three main components that are interrelated in the scientific publications analyzed. This relationship indicates a consistent academic interest in intervention models that focus on improving social skills for individuals with ASD. In addition, cluster analysis obtained from bibliometric data highlights various thematic aspects, such as behavior, children, adolescents, and adults, that shape trends in this research. Each cluster reflects a broader understanding of how social interaction models are developed for different age groups, from children to adults with ASD.

Based on the results of this study, there are several research opportunities that can be explored further, including social support, life satisfaction, and parent-child interaction therapy (PCIT). These themes are still rarely discussed in the context of

ASD, but have great potential in the development of more inclusive and responsive social interaction models. Thus, future research can enrich collaborative intervention models that holistically support individuals with ASD in various aspects of life, especially in social skills which are their main challenges.

Figure 6 shows that the keyword "autism spectrum disorder" has the largest circle which indicates that research with this keyword has been done a lot, this keyword has a purple circle which indicates that research related to autism spectrum disorder is an older research. Keywords with small circles and yellow color are research that is still rarely done and the latest. Some keywords that are still rarely done by researchers include: (1) social support, social support entails feeling cared for by others and having a trusted network to go to in ordinary or emergencies (Cobo-Rendón et al., 2020). Researchers can conduct further analysis related to the relationship between social support and ASD, for example the Influence of Social Support Network on the Subjective Wellbeing of Children with Autism Spectrum Disorder or can also use experiments or other research methods; (2) life satisfaction, life satisfaction meaning in life and hope are some of the most essential aspects influencing a person's feelings and sentiments in dangerous situations (Karataş et al., 2021). Researchers can conduct further research on the correlation between life satisfaction in adolescents with autism spectrum disorders, or a model that can increase life satisfaction in someone with ASD; (3) pcit (parent child interaction therapy), parent-child interaction therapy (PCIT) is a low-cost, short-term treatment technique that focuses on interactions between parents and children and tries to improve child behaviour (Ulaş et al., 2023). PCIT (Parent Child Interaction Therapy), is a therapy that can be done to improve children with ASD, researchers can experiment with the PCIT model and the impact on ASD or use other appropriate methods; (4) role, role is the position or purpose that someone or something has in a situation, organization, society, or relationship. Researchers can conduct further research related to roles and ASD, as done by (Niken Baghiroh et al., 2020) conducting research related to Role of Government Service for Autism Spectrum Disorder (ASD) Children; (5) differential diagnosis, differential diagnosis is an amount of difference a judgment about what a particular illness or problem is. Researchers can conduct

further research related to differential diagnosis of Autism Spectrum Disorders such as learning disabilities, ADHD and social communication disorders; and (6) neurodevelopmental disorder, neurodeelopmental disorders are disorders that are found in the development of nerves, so that they can affect the performance of activity in the nerves (Lee et al., 2023).

Researchers also tried to conduct further analysis by looking at the relationship between keywords. When the cursor is hovered over one of the keywords, the VOSviewer visualization will associate it with other related keywords. However, some keywords are not related when the cursor is directed at one of the keywords. We think this is a gap and an opportunity for future research themes by combining unrelated keywords. For example, Figure 7 shows one possible future research theme.

Figure 7. Further Research Opportunities between "model" and "social stories"

Researchers chose the keyword "model" for analysis. In Figure 7, shown in the black dotted line, we can see that the keyword "model" is not related to the keyword "social support". This condition allows for further investigation. In addition to the keyword "social support". There are several keywords that are still not related to the keyword "model", some of these keywords such as: (1) social skill, social skill is an ability to do an activity or job well activities in which you meet and spend time with other people (O'Shea S, 2012); (2) pcit (parent child interaction therapy, (3) parent, parent is a mother or father of a person or someone who looks after a person in the same way that a parent does (O'Shea S, 2012); (4) family, family is a group of people who are related to each other, such as a mother, a father, and their children (O'Shea S, 2012) (5) social support, (6) anxiety, anxiety is an uncomfortable feeling of nervousness or worry about something that is happening or might happen in the future (O'Shea S, 2012); (7) diagnosis, diagnosis is a judgment about what a particular illness or problem is, made after examining it (O'Shea S, 2012) and (8) social behavior, social behavior is the way that someone behaves in which

you meet and spend time with other people (O'Shea S, 2012). This condition is an opening for further research. Researchers can develop or conduct other research methods according to keywords that are still rarely carried out by research or collaborate between keywords that are not yet related.

Conclusion

During the period from 2013 to 2023, an extensive analysis of the collaboration model aimed at enhancing the social interaction skills of individuals with Autism Spectrum Disorder (ASD) was conducted. The results of this study reveal that a significant number of scientific publications, precisely 1000, were indexed in renowned databases such as Crossref, PubMed, and Scopus. These findings shed light on the growing interest and extensive research efforts dedicated. The most scientific publications occurred in 2021 with a total of 192 publications, the types of publications were dominated in the form of (1) books; (2) book chapters; (3) journal articles; (4) posted content and (5) procedding. Thematic trends based on VOSviewer output are related to (1) asd; (2) child; (3) behavior; (4) autism spectrum disorder; (5) adult and (6) adolescent. Bibliometric analysis in the

form of mapping provides information related to publication development patterns, with these findings providing information for further research that is still rarely researched such as: (1) social support, (2) life satisfaction, (3) pcit (parent child interaction therapy), (4) role, (5) differential diagnosis, and (6) neurodevelopmental disorder.

ACKNOWLEDGMENT

The author would like to express his deepest gratitude to Universitas Negeri Yogyakarta, as affiliates of the authors. Deep gratitude was also conveyed to all parties involved in this study.

Conflict of Interest

We declare that the article we have written is not involved in any conflict of interest.

Ethics Statement

This research has met ethical rules. Research ethical approval was obtained Ethical Approval with number 1566/EC/KEPK/IX/2024.

Author Contributions

Study design, DTPP, EP, and H; Data collection, DTPP; Statistical analysis, DTPP; Data interpretation, DTPP; Literature search, DTPP. All authors have read and approved the published version of the manuscript.

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