



Bibliometric Analysis of Publications on PANDAS Syndrome in Psychiatry Research Area

Psikiyatri Araştırma Alanında Pandas Sendromu ile İlgili Yayınların Bibliyometrik Analizi

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ABSTRACT

Aim: Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS syndrome) is a neuropsychiatric disorder whose diagnosis and treatment are controversial. The goal of this study was to highlight trends and discuss problems in PANDAS syndrome research since 1998 and to assist researchers in identifying new avenues for this field of study.

Material and Method: This study entails a bibliometric analysis of academic research papers in the field of psychiatry focusing on the PANDAS literature published between 1998 and May 2023. The Vosviewer program was used to conduct bibliometric analysis on the articles chosen from the Web of Science Core Collection.

Results: The analysis encompassed a total of 361 publications, with the highest number of publications occurring in 2004. In the subsequent years, the publication count exhibited an irregular pattern. The most influential publications, garnering 881 citations, were published in 2021. Among the prominently contributing countries, the United States (n=191, 52.91%) held the majority, followed by Italy (n=43, 11.91%), England (n=32, 8.86%), Germany (n=18, 4.98%), Sweden (n=13, 3.60%), Turkey (n=13, 3.60%), and Spain (n=10, 2.77%). Notably, the United States, the United Kingdom, Italy, and Germany displayed extensive collaboration with numerous other countries. The National Institute of Mental Health, Yale University, and Johns Hopkins University emerged as the most productive institutions.

Conclusion: Through this study, we conducted a review of global studies on PANDAS in the field of psychiatry, aiming to emphasize the identified issues. The findings of this study reveal that the number of publications on PANDAS is still significantly lower than anticipated. Considering the numerous uncertainties surrounding the diagnosis, treatment, and etiology of PANDAS syndrome, there is a pressing need for enhanced global scientific productivity in this area.

Keywords: Bibliometrics, PANDAS syndrome, publications

ÖZ

Amaç: Pediatrik otoimmün streptokok enfeksiyonlarıyla ilişkili nöropsikiyatrik bozukluklar (PANDAS sendromu), teşhisi ve tedavisi tartışmalı bir nöropsikiyatrik bozukluktur. Bu çalışmanın amacı, 1998'den bu yana PANDAS sendromu araştırmalarında görülen eğilimleri vurgulamak ve tartışmak, araştırmacılara bu alan için yeni olanaklar belirlemelerine yardımcı olmaktır.

Gereç ve Yöntem: Bu çalışma, 1998 ile Mayıs 2023 arasında yayınlanmış olan PANDAS literatürüne odaklanan psikiyatri alanındaki akademik araştırma makalelerinin bibliyometrik analizini içermektedir. Web of Science Core Collection'dan seçilen makaleler üzerinde bibliyometrik analiz yapmak için Vosviewer programı kullanılmıştır.

Bulgular: Analiz, toplamda 361 yayını içermektedir. En fazla yayının olduğu yıl 2004'tür. Takip eden yıllarda yayın sayısı düzensiz bir seyir izlemiştir. En çok atıfta bulunan yayınlar ise 2021'de yayınlanmış olup toplamda 881 atıf almışlardır. En çok yayın yapan ülkeler olarak Amerika Birleşik Devletleri (n=191, %52.91), İtalya (n=43, %11.91), İngiltere (n=32, %8.86), Almanya (n=18, %4.98), İsveç (n=13, %3.60), Türkiye (n=13, %3.60) ve İspanya (n=10, %2.77) belirlenmiştir. Amerika Birleşik Devletleri, Birleşik Krallık, İtalya ve Almanya, diğer ülkelerle en çok iş birliği yapan ülkelerdir. Ulusal Ruh Sağlığı Enstitüsü, Yale Üniversitesi ve Johns Hopkins Üniversitesi en üretken kurumlar olarak öne çıkmaktadır.

Sonuç: Bu çalışma kapsamında, psikiyatri alanındaki PANDAS üzerine küresel çalışmaları gözden geçirdik ve vurgulamak istediğimiz konuları belirlemeye çalıştık. Bu çalışmanın bulguları, PANDAS üzerine yapılan yayın sayısının hala beklenenden önemli ölçüde daha düşük olduğunu ortaya koymaktadır. PANDAS sendromunun tanı, tedavi ve etiyolojisiyle ilgili birçok belirsizlik göz önüne alındığında, bu alanda küresel bilimsel üretkenliğin artırılması için acil bir ihtiyaç vardır.

Anahtar Kelimeler: Bibliyometri, PANDAS sendromu, yayınlar

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INTRODUCTION

The autoimmune reaction to infection of group A streptococci (GAS) is assumed to be the cause of PANDAS syndrome (Pediatric Autoimmune Neuropsychiatric Disorders Associated with streptococcal infections) (1). It is proposed that the antigenic structure of Group A streptococci is similar to neuron proteins, which may lead to antibody formation and the inadvertent onset of an autoimmune response. However, over the years, researchers found that the levels of suspected antibodies (such as Anti-streptolysin-O, AntiDNAase B) did not increase in the blood during recurrent disease exacerbations in PANDAS patients, and this deficiency has been found in many studies (2). Numerous studies have examined investigated the link between streptococcal infections and sudden onset of neuropsychiatric symptoms. Initial reports suggested that neuropsychiatric issues could emerge up to 9 months after GAS infection (1,3).

In 1998, Swedo et al. (3) initially reported 50 cases of a specific subtype of pediatric obsessive-compulsive disorder (OCD) characterized by the sudden onset and episodic course of symptoms. Swedo et al. (3) introduced the term PANDAS. OCD is typically characterized by obsessive behaviors and rituals. The projected lifetime prevalence of OCD comorbidity is 2.3%, which is noticeably high (4). PANDAS' initial diagnostic standards were put forth in 1998 (3). In order to elucidate the mechanism of the disease, which is thought to have an autoimmune basis, to form an etiologically homogeneous group, and to conduct scientific research on these patients, patients must meet all established criteria completely (5). A 2012 article outlined the PANDAS definition's shortcomings and expressed concerns about how to classify individuals who met all PANDAS criteria but did not have a GAS infection (6). Despite substantial advancements in the study of OCD, significant concerns about the disorder's importance for public health, proper diagnostic classification, and clinical heterogeneity still need to be answered (3,4). Thus, patients who did not meet all criteria but were clinically very similar were excluded from the classification. The authors of PANDAS recognized the weakness of the classification system in including patients who met most, but not all, of the criteria. Thus, they proposed the PANS (Pediatric Acute-onset Neuropsychiatric Syndrome) classification, aiming to classify in-between cases and adolescent cases that do not meet all PANDAS criteria. The CANS (Childhood Acute Neuropsychiatric Syndrome) classification was later added to the literature. The criteria for diagnosis in both of the new classification systems differ significantly, although they both categorize OCD symptoms and tics along with mental symptoms including anxiety, emotional instability, and irritability. In addition, PANS and CANS have been used to include a wider range of

patients in the childhood age group (before the age of 18) by removing the requirement of "pre-adolescence" in PANDAS. Another difference is that there is no requirement to identify the triggering infectious agent or environmental triggers such as GAS. In addition, in the PANS definition, it was stated that restriction of food intake or change in eating behavior alone could meet the criterion that OCD and/or tics should be detected (6).

It is not apparent if the diagnostic standards for PANS are specific enough to identify a separate clinical entity. But adding the sudden development of psychiatric symptoms as a requirement seems to separate certain kids apart from other kids who are referred for PANS screening (7). Even if there isn't enough evidence to prove conclusively that PANDAS is an autoimmune disorder, questions about its diagnosis, management. Also, given that this ailment is now more widely known and that this diagnostic category appears to be being used more frequently, the etiology has to be determined (8). Additionally, PANDAS management literature is ambiguous, and there is no clinical consensus on the best course of treatment (1).

Despite the fact that bibliometric analysis is frequently utilized in numerous aspects of medicine (9-16), there has yet to be a similar examination of PANDAS syndrome in the psychiatry research area. The goal of the present investigation is to identify and analyze the most referenced publications, predominantly published journals, most often occurring keywords, and most recognized countries and organizations on PANDAS syndrome in psychiatry research published between 1998 and May 2023.

MATERIAL AND METHOD

The PANDAS literature, which consists of academic research papers in the fields of psychiatry and closely associated disciplines, was assessed bibliometrically for this study. To lessen bias brought on by database updates, the data from 1998 to May 31, 2023 was retrieved from the Web of Science core collection on June 1, 2023. These keywords were used to pull information from the online Web of Science database: Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal infections (Topic) OR PANDAS syndrome (Topic) OR PANDAS/PANS (Topic) OR PANDAS/CANS in Psychiatry; Autism & Development Disorders and Neurodegenerative Diseases research areas. For further examination, all records—including titles, summaries, and citations—were exported. The VOSviewer software (VOSviewer_1.6.19) was also utilized to illustrate the thorough data analysis in addition to the gathering of information. Additionally, we used the bibliometric website (<https://bibliometric.com/>) to display the evolution of keywords and publisher

countries through time. We also downloaded the data in tab-delimited format, complete with full records with associated references, for use with this bibliometric website.

RESULTS

1. Publication and Citation Characteristics

The first publications on PANDAS were published in 1998 and 7 articles were published in this year. After the first publications (1998), a total of 361 publications on PANDAS in the field of psychiatry were indexed in the Web of Science database until the end of May 2023. In this study, these 361 publications were analyzed in detail. In 2004, 25 publications were published and this was the year with the highest number of publications. In the following years, the number of publications has been irregular. The most cited publications were published in 2021, and these publications received 881 citations. The publications published between 1998 and 2023 received 10,982 total citations (7,175 without self-citation) and the average H index of the publications was 56 according to the analysis of the Web of Science database.

According to our findings, the article published by Swedo et al. (3) in 1998 named 'Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections: Clinical description of the first 50 cases' was the most cited article with 924 total citations. The top 15 most cited articles on PANDAS in psychiatry research are summarized in **Table 1**.

2. Most productive organizations/countries and funding agencies

By analyzing the country information based on author affiliations, it is possible to gain insights into the distribution of PANDAS research studies across different countries. This research area has seen contributions from numerous institutes or colleges from 35 countries worldwide. The United States (n=191, 52.91%), Italy (n=43, 11.91%), England (n=32, 8.86%), Germany (n=18, 4.98%), Sweden (n=13, 3.60%), Turkey (n=13, 3.60%), and Spain (n=10, 2.77%) have emerged as the leading publishing countries in PANDAS research. **Figure 1** illustrates the changes in the number of articles by country over the years. The United States continually maintained the highest level of productivity among the top 10 countries with the most publications. Spain witnessed a surge in publications between 2008 and 2011, followed by a decline. Notably, between 2014 and 2020, the quantity of articles from Turkey increased, and from Sweden between 2015 and 2023.

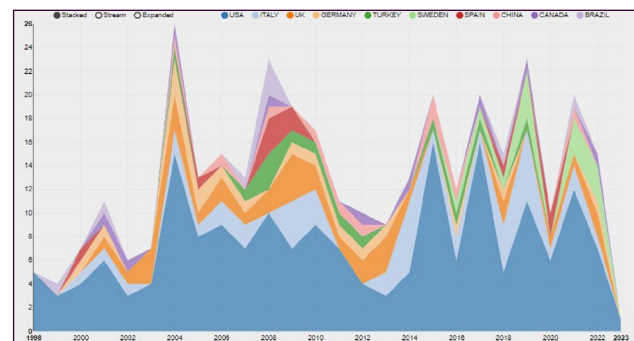


Figure 1. Changes in the number of articles by country over the years

Table 1. Most cited publications about PANDAS syndrome			
Title	Authors	Publication Year	Total Citations
Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections: Clinical description of the first 50 cases	Swedo, et al.	1998	924
Tourette's syndrome: from behaviour to biology	Singer, HS	2005	212
The neural bases of obsessive-compulsive disorder in children and adults	Maia, et al.	2008	206
Cognitive impairment in 873 patients with idiopathic Parkinson's disease - Results from the German Study on epidemiology of Parkinson's disease with dementia (GEPAD)	Riedel, et al.	2008	206
Prospective identification and treatment of children with pediatric autoimmune neuropsychiatric disorder associated with group A streptococcal infection (PANDAS)	Murphy, et al.	2002	187
A pilot study of penicillin prophylaxis for neuropsychiatric exacerbations triggered by streptococcal infections	Garvey, et al.	1999	168
Association between streptococcal infection and obsessive-compulsive disorder, Tourette's syndrome, and tic disorder	Mell, et al.	2005	158
Clinical Evaluation of Youth with Pediatric Acute-Onset Neuropsychiatric Syndrome (PANS): Recommendations from the 2013 PANS Consensus Conference	Chang, et al.	2015	153
Antibiotic prophylaxis with azithromycin or penicillin for childhood-onset neuropsychiatric disorders	Snider, et al.	2005	149
Neurobiology of Tourette Syndrome: Current Status and Need for Further Investigation	Felling, et al.	2011	142
Antibody-mediated neuronal cell signaling in behavior and movement disorders	Kirvan, et al.	2006	133
A Dopamine Hypothesis of Autism Spectrum Disorder	Paval, Denis	2017	128
PANDAS: current status and directions for research	Snider, and Swedo, SE	2004	127
Behavioral, Pharmacological, and Immunological Abnormalities after Streptococcal Exposure: A Novel Rat Model of Sydenham Chorea and Related Neuropsychiatric Disorders	Brimberg, et al.	2012	123
Tourette's syndrome: a cross sectional study to examine the PANDAS hypothesis	Church, et al.	2003	123



Regarding funding sources, the majority of PANDAS studies were funded by the National Institutes of Health USA (n=63), the United States Department of Health Human Services (n=63), and the National Institute of Mental Health (n=40). **Table 2** presents the top 10 funding agencies out of a total of 220.

Funding Agencies	n	% of 361
National Institutes of Health USA	63	17.45
United States Department of Health Human Services	63	17.45
Nih National Institute of Mental Health	40	11.08
Nih National Institute of Neurological Disorders Stroke	12	3.32
Tourette Syndrome Association	6	1.66
Nih Eunice Kennedy Shriver National Institute of Child Health Human Development	5	1.38
Stockholm County Council	5	1.38
Swedish Research Council	5	1.38
Centers For Disease Control Prevention USA	4	1.11
Narsad	4	1.11

* Showing 10 out of 220 funding agencies.

3. Collaboration between Institutions and Countries/Regions

The United States, with 8,007 citations, 189 documents, and a total link strength of 35, emerged as the country with the highest number of publications and the most collaboration with other countries. The United Kingdom followed with 947 citations, 32 documents, and a total link strength (TLS) of 26. Italy ranked third with 729 citations, 43 documents, and a TLS of 25. Germany came fourth with 609 citations, 17 documents, and a TLS of 15. These countries demonstrated extensive cooperation in PANDAS research (**Table 3, Figure 2**).

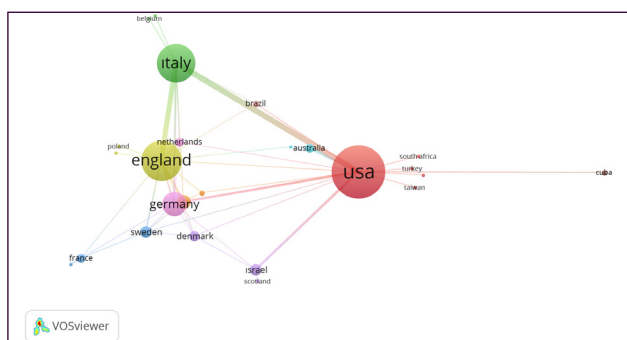


Figure 2. The international collaborations between mostly publishing countries

Among institutions, the National Institute of Mental Health (NIMH) stood out with 2,960 citations, 36 documents, and TLS of 49. Yale University followed with 1,232 citations, 24 documents, and a TLS of 34. Johns Hopkins University ranked third with 1,176 citations, 21 documents, and a TLS of 13. These institutions were identified as the most prolific contributors to PANDAS research (**Figure 3**).

Country	Number of documents	Citations	Total link strength
Australia	6	191	5
Belgium	1	1	1
Brazil	8	259	4
Canada	9	194	3
Croatia	1	0	0
Cuba	2	13	3
Denmark	5	191	6
France	4	41	5
Germany	17	609	15
Japan	3	14	0
Mexico	7	21	3
Netherlands	8	214	5
Norway	3	28	8
Peoples Republic of China	6	67	1
Poland	2	9	1
Portugal	1	0	0
Romania	3	152	0
Russia	1	3	0
Scotland	1	10	1
South Africa	3	50	1
South Korea	1	3	0
Spain	10	107	0
Sweden	13	211	7
Switzerland	2	17	2
Taiwan	4	95	1
Turkey	13	75	1
Ukraine	1	1	0
The United Kingdom	32	947	26
The United States	189	8007	35
India	7	10	2
Iran	3	27	1
Ireland	1	10	1
Israel	6	292	7
Italy	43	729	25

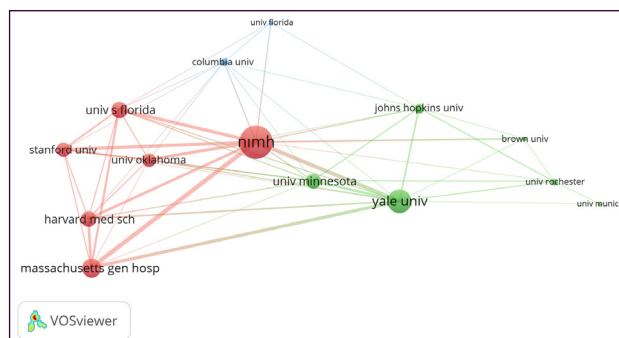


Figure 3. The co authorship between organisations

4. Keyword's Characteristics

Table 4 shows the total link strength (TLS) of the keywords with more than 10 occurrences. The terms 'PANDAS (130 occurrences, total link strength: 280),



prophylaxis do not support their use for this specific therapeutic indication (8). In summary, it's crucial to keep in mind PANDAS is a somewhat controversial diagnosis, and there is ongoing research to better understand the condition.

While several bibliometric studies have been conducted on psychiatric disorders (23-26), there is currently no bibliometric analysis available for PANDAS syndrome. Therefore, the objective of this research is to identify and analyze the most frequently mentioned papers, occasionally published journals, highly cited keywords, as well as recognized countries and organizations within the field of psychiatric research between 1998 and May 2023.

The bibliometric technique investigates the structures of document generation, circulation, and application, as well as the structure and evolution of science and technology, by focusing on numerous exterior features of publications such as authors, keywords, abstracts, citations, and so on. Because of its ability to evaluate and anticipate research output, bibliometric analysis has been used for a wide range of topics or fields (17,23-26). Bibliometric analyses are one of the most prevalent ways of assessing the dependability, quality, and effect of scientific investigations. One of the essential factors in this analysis is citation frequency, which is the number of times a publication is cited by other researchers (17). The most frequently referenced publications are the most influential in that particular scientific discipline. It can also be used to prioritize research support organizations and discover areas that have not been sufficiently researched (18,19). Overall, bibliometrics in medicine offers valuable insights into research productivity, impact, trends, and collaboration opportunities. It assists in evaluating the significance of scientific work, informs funding decisions, and contributes to evidence-based medicine practices. Researchers can assess the citation patterns of relevant articles, identify influential studies, and analyze the impact of research on clinical practice. This helps in determining the strength of evidence and making informed decisions about medical interventions. Also, bibliometric analysis enables the identification of emerging trends and areas of research interest. By examining publication patterns and citation networks, researchers and funding agencies can gain insights into the evolving landscape of medical research. This information can guide decisions regarding research prioritization, resource allocation, and strategic planning for future studies (17,23-26).

According to our findings, the article 'Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections' published by Swedo et al. (3) in 1998 named 'Clinical description of the first 50 cases' was the most cited article with 924 total citations. The findings of this investigation corroborate the PANDAS diagnostic

criteria's effectiveness in identifying a distinct, clinically homogeneous group of individuals. Furthermore, the unique clinical manifestations identified in this research are not only identical to those documented in the first PANDAS cohort (3).

Susan Swedo specializes as a pediatric and neuropsychiatric researcher. She was Chief of the Pediatrics and Developmental Neuroscience Branch at the United States National Institute of Mental Health beginning in 1998. Swedo was the lead author of a paper in 1994 that described PANDAS disease, a controversial hypothesis (20) that proposed a link between Group A streptococcal infection in children and some rapid-onset cases of OCD or tic disorders such as Tourette syndrome (21). Swedo left the NIH in 2019 and now serves on the PANDAS Physician Network (22). Susan Swedo was also the author who published the most articles (n=31) on PANDAS in the psychiatry research area in our study. Also, advocacy groups have emerged and have made an effort to influence legislation at the governmental level. Examples include the PANDAS Network in the United States and PANDASHELP in Canada (8). The United States (n=191, 52.91%), Italy (n=43, 11.91%), the United Kingdom (n=32, 8.86%), Germany (n=18, 4.98%), Sweden (n=13, 3.60%), Turkey (n=13, 3.60%) and Spain (n=10, 2.77%) were identified as the countries with the highest number of publications on PANDAS. Also, our findings revealed that in terms of international collaboration, two distinct networks emerged: the European network and the worldwide network. In the European network, no single country is distinguished in terms of engagement with others. However, the United States is the hub of the worldwide network, with the greatest cooperation with other linked countries, followed by the United Kingdom and Germany. The United States, United Kingdom, and Germany lead many international collaborations on PANDAS research, in keeping with their high research productivity.

Although previously published cohort surveys have suggested a potential link between infections and OCD and tics, it remains unclear whether ongoing inflammation is the driving factor behind symptoms in these children. Furthermore, there is a lack of evidence supporting the presence of persistent inflammation in biological samples from children with PANDAS/PANS. Research on OCD and tic disorders has yielded diverse but predominantly negative outcomes (20). A systematic analysis investigating the association between cytokines and OCD found a decrease in IL-1, but no clear association between higher levels of cytokines (TNF- α , IL-6) and OCD. It should be noted that confounding factors such as concurrent illnesses, age, and medication usage may have influenced these findings (27). Previous studies have reported fluctuations in serum cytokine levels following exacerbations of Tourette's syndrome/

tics in children (28). Antineuronal antibodies have not been proven to trigger the PANDAS/PANS phenotype, and only a few short trials on psychiatric therapy in the context of PANDAS/PANS have been conducted (20). Keyword analysis can serve as a guide for further research (9, 13). In this study, the analysis of keywords revealed that "PANDAS" (130 occurrences, total link strength: 280), "obsessive-compulsive disorder" (66 occurrences, total link strength: 157), and "tics" (36 occurrences, TLS: 107) were the most frequently mentioned keywords. According to our keyword analysis, we found that researchers are investigating the underlying mechanisms that contribute to the development of PANDAS. This includes exploring the role of streptococcal infections, immune dysregulation, autoimmunity, and the impact on the central nervous system. Studies are being conducted to identify specific antibodies and immune markers associated with PANDAS. Also, efforts are underway to refine and improve the diagnostic criteria for PANDAS. Researchers are exploring the use of biomarkers, such as antibody levels, cytokines, and other immune markers, to aid in diagnosis and distinguish PANDAS from other neuropsychiatric conditions. Another finding of our study that, this research is focused on optimizing treatment strategies for PANDAS. This includes investigating the effectiveness of antibiotics, immune-modulating therapies (such as intravenous immunoglobulin or plasma exchange), and psychiatric interventions (such as cognitive-behavioral therapy and medication management). Studies are being conducted to assess the short-term and long-term outcomes of different treatment approaches. Longitudinal studies are being conducted to evaluate the long-term outcomes of children with PANDAS. Researchers are examining the persistence of symptoms, the impact on cognitive and academic functioning, the risk of developing other psychiatric disorders, and the potential effects on quality of life into adulthood. Understanding the natural course and prognosis of PANDAS is essential for providing appropriate support and interventions. Brain imaging techniques (functional magnetic resonance imaging (fMRI), electroencephalography (EEG), etc.) are being used to study the neurobiological mechanisms associated with PANDAS. These studies aim to identify specific brain regions and neural circuits that are involved in the manifestation of PANDAS symptoms, providing insights into the neurobiology of the disorder. Research is being conducted to detect the prevalence of PANDAS and related factors such as genetic predisposition, environmental influences, infections, or underlying medical conditions in the pediatric population. Studies are exploring the incidence of streptococcal infections and the likelihood of developing PANDAS following an infection. Epidemiological data is important for understanding the scope of the condition and its impact on public health.

The journals that publish the most publications on a topic may also be helpful for researchers to find journals for their publications (29-32). The journals that publish the most publications on PANDAS may also be helpful for researchers in this field to find journals for their publications. The journals that publish the most publications on PANDAS may also be helpful for researchers in this field to find journals for their publications. Journal of Child and Adolescent Psychopharmacology, Journal of Child Neurology, and the Journal of Neuroimmunology published most of the PANDAS studies. Most of these journals were in the field of psychiatry and pediatrics. This may be because PANDAS syndrome is a neuropsychiatric disorder seen in children.

Limitations

This study has several limitations worth noting. Firstly, it was restricted to a specific timeframe and utilized a particular internet portal for data collection, focusing solely on the field of psychiatry. Although no similar study has been published to date, the generalizability of the findings may be limited. Additionally, while visualization and mapping methods were employed in this study, more in-depth analyses such as content analysis or detailed examination of trends, publication numbers of specific journals and institutions over the years, and annual growth rates were not conducted. Future studies could incorporate these aspects for a more comprehensive understanding of the topic.

CONCLUSION

In summary, the study findings highlight that the number of publications on PANDAS remains significantly lower than anticipated. There is a pressing need to enhance global scientific production on PANDAS syndrome, considering the multitude of unknowns surrounding its diagnosis, treatment, and etiology. While there have been contributions from the United States and developed European countries, it is essential to note that the literature on PANDAS involves only 35 countries. Given the severe impact of symptoms on individuals and their families, it is crucial to identify evidence-based and effective interventions, as well as conduct research on the incidence, prevalence, and biological underpinnings of this condition. Collaborative efforts among institutions, detailed clinical phenotyping through collaborative registries, and well-designed investigations into underlying molecular mechanisms are imperative to achieve these objectives. It is important to note that PANDAS research is an ongoing and evolving field. There are varying perspectives and ongoing debates within the scientific community regarding its etiology, diagnosis, and treatment. As a result, further research is needed to address unanswered questions,



establish consensus on diagnostic criteria, and develop evidence-based treatment guidelines for PANDAS. The research conducted in these areas will contribute to a better understanding of PANDAS and improve the care and outcomes for affected children.

ETHICAL DECLARATIONS

Ethics Committee Approval: Ethical approval is not required as this study is not a human or animal study.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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