



Research Article | Araştırma Makalesi

BIBLIOMETRIC ANALYSIS OF RESEARCH IN ABSENCE EPILEPSY

ABSANS EPİLEPSİ ARAŞTIRMALARININ BİBLİYOMETRİK ANALİZİ

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ABSTRACT

Objective: Absence epilepsy is one of the most common types of epilepsy in childhood. Absence epilepsy is a neurological disorder that has been subject to clinical and experimental research for a long time. This study aims to provide a different perspective on absence epilepsy research studies through bibliometric analysis using literature data related to keywords related to "absence epilepsy" from the Web of Science (WoS) online database between 2015 and 2025.

Methods: Bibliometric data were obtained from the WoS online database. They were analyzed and visualized using the VoS Viewer program. Our analysis presents articles, publication years, authors, areas of study, types of documents, countries, institutions, publication years, citations, and then the number of citations.

Results: Based on the analysis results, 2025 was identified as the year with the highest article productivity. A total of 4,507 articles were examined. Overall, the rate of publication growth on the topic has been stable. When looking at the top three countries in terms of article productivity, the United States, Italy, and China stand out, respectively. The top three institutions with the highest number of publications are the Institute National de La Sante et de La Recherche Medicale Inserm, the University of London, and the University of Melbourne.

Conclusion: This study sheds light on the evolution of research output in absence epilepsy over the years and the contributions made in this field. It provides valuable information for researchers evaluating future studies to identify potential areas of discovery and contribute to the advancement of the field.

Keywords: Absence epilepsy, bibliometric analysis, Web of Science, VOSviewer

Öz

Amaç: Absans epilepsi, çocukluk çağında en sık görülen epilepsi türlerinden biridir. Absans epilepsi, uzun süredir klinik ve deneysel araştırmalara konu olan nörolojik bir bozukluktur. Bu çalışma, 2015-2025 yılları arasında Web of Science (WoS) çevrimiçi veritabanından "absans epilepsi" ile ilgili anahtar kelimelerle ilgili literatür verilerini kullanarak bibliyometrik analiz yoluyla absans epilepsi araştırmalarına farklı bir bakış açısı sunmayı amaçlamaktadır.

Yöntemler: Bibliyometrik veriler WoS çevrimiçi veritabanından elde edildi. Bunlar VoS Viewer programı kullanılarak analiz edildi ve görselleştirildi. Analizimiz makaleleri, yazarları, konu alanını, belge türlerini, ülkeleri, kurumları, yayın yıllarını, atıfları ve atıf sayısını içermektedir.

Bulgular: Analiz sonuçlarına göre, 2025 yılı en yüksek makale verimliliğine sahip yıl olarak belirlendi. Toplam 4.507 makale incelendi. Genel olarak, konuyla ilgili yayın büyüme oranı istikrarlı olmuştur. Makale üretkenliği açısından ilk üç ülkeye bakıldığında, sırasıyla Amerika Birleşik Devletleri, İtalya ve Çin öne çıkmaktadır. En yüksek yayın sayısına sahip ilk üç kurum ise Ulusal Sağlık ve Tıp Araştırma Enstitüsü (Inserm), Londra Üniversitesi ve Melbourne Üniversitesi'dir.

Sonuç: Bu çalışma, yıllar içinde absans epilepsi alanındaki araştırma çıktısının evrimine ve bu alana yapılan katkılara ışık tutmaktadır. Araştırmacılar için potansiyel keşif alanlarını belirlemek ve alanın ilerlemesine katkıda bulunmak amacıyla gelecekteki çalışmalarını değerlendirirken değerli bilgiler sağlamaktadır.

Anahtar Kelimeler: Absans epilepsi, bibliyometrik analiz, Web of Science, VOSviewer



Introduction

Absence epilepsy is a common childhood epileptic syndrome characterized by non-convulsive seizures. It is known to affect 10-17% of all cases in those with epilepsy. Seizures typically begin between the ages of 4 and 10 and are more common in girls. Seizures are characterized by brief loss of consciousness lasting a few seconds and rhythmic eye blinking, and can occur multiple times a day. Seizures have characteristic patterns on the electroencephalogram (EEG) (bilateral, symmetric, and synchronous) and are characterized by spike-wave discharges (SWD) at approximately 3 Hz.^{1,2} The pathophysiology of absence epilepsy is still not figured out. The responsible mechanisms causing seizures are characterized by increased neuronal excitability and synchronous discharges. Epileptogenic pacemakers cause seizures due to hypersensitivity and abnormal discharges. Generalized epilepsy is defined with seizures and synchronous abnormal discharges in both hemispheres on the EEG. Seizures occur in the ventrobasal and reticular nuclei, as well as in the somatosensory region of the cortex. The corticothalamocortical system also links these regions.^{3,4} Experimental animals are commonly used for laboratory research to improve understandings and further investigations. Genetically modified animals with absence seizures have been used for absence epilepsy researches. These animals are presenting characteristics of absence epilepsy in human clinical course as so they are desired for evaluating the pathophysiology and evolution of absence epilepsy. Experimental animal use mostly provides advantages for recording EEGs regularly, making comparisons between animals with and without having pathophysiology, collecting data at the all stages of before, during and after seizures. Chemical models can be used with drugs like penicillin and pentylentetrazol. The WAG/Rij and GAERS rats are commonly used as genetic models of absence epilepsy.^{5,6} Three pharmacological agents are usually used in the first-line treatment of absence epilepsy. Although, first choice is generally valproic acid. The efficiency of controlling identified cases is 70-80%. If first-line treatment is ineffective lamotrigine or ethosuximide can be applied to treatment. The seizures that do not respond to these treatments, levetiracetam, topiramate, and zonisamide may be considered as alternative antiseizure therapeutics.⁷

This bibliometric study presents a review of academic research on absence epilepsy. The study is designed to inspire further research. Presented data suggest that the number of publications in this area of study remains relatively stable. We used bibliometric analysis to review research on absence epilepsy systematically. We aimed to provide a comprehensive overview from a holistic perspective, and envision future trends by comparing research conducted across countries, authors, and institutions. Regarding to this purpose, we conducted a visual bibliometric analysis of the absence epilepsy literature from the Web of Science core collection using

VOSviewer software. This study aims to provide a comprehensive bibliometric overview of the field in order to enhance awareness and guide future research.

Methods

The study did not involve human or animal studies and was a retrospective analysis using existing data, institutional ethics committee approval was not obtained. This study was conducted by using The Web of Science database. The study is designed to systematically evaluate the documents, the research focused on studies published in the Web of Science database between 2015 and 2025. The time period was chosen to capture the most relevant and up-to-date literature in the field and to reflect recent research trends. A methodical search strategy was intended utilizing a combination of Medical Subject Headings (MeSH) terms and associated keywords. The search was included of the term "absence epilepsy" which were searched in the Web of science for the period of 2015 to 2025. Our bibliometric analysis includes articles, authors, types of documents, countries, languages, affiliations, publication years, citations, and then the number of citations. The date of bibliometric analysis was 30.12.2025, collecting all data from 2015 to 2025 to this date were analyzed. No limitations were applied language, enabling comprehensive data collection. Web of science allows a maximum of 1000 data to be downloaded as reports in a time. In final dataset based on 4507 publications for our bibliometric analysis.

Statistical Analysis

A total of 4507 documents were analyzed. We used Excel (Microsoft Office Excel 2021) to report the source of data. The data in the tables were transformed into absolute numerical values. (percentage and frequency) The parameters examined using VOSviewer (version 1.6.20) to identify main research themes, conceptual theoretical models and new development trends within the chosen literature.

Results

Out of 4507 articles, 2534 were entirely open access, while 2474 were in English.

The distribution of articles by year reveals 417 articles in 2015, 364 articles in 2016, 418 articles in 2017, 403 articles in 2018, 424 articles in 2019, 387 articles in 2020, 396 articles in 2021, 414 articles in 2022, 426 articles in 2023, 410 articles in 2024 and 444 articles in 2025 (Figure 1).

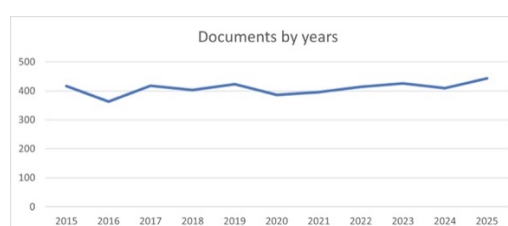


Figure 1. Documents by years

Documents types were as listed; article (n=3465, 77%), Article; Book Chapter (n=45, 1%), Article; Early Access (n=45, 1%), Article; Proceedings Paper (n=13, 0%), Article; Publication with Expression of Concern (n=1, 0%), Article; Retracted Publication (n=3, 0%), Biographical-Item (n=1, 0%), Correction (n=7, 0%), Editorial Material (n=100, 2%), Letter (n=27, 1%), Meeting Abstract (n=130, 3%), Retraction (n=1, 0%), Review (n=609, 14%) (Figure 2).

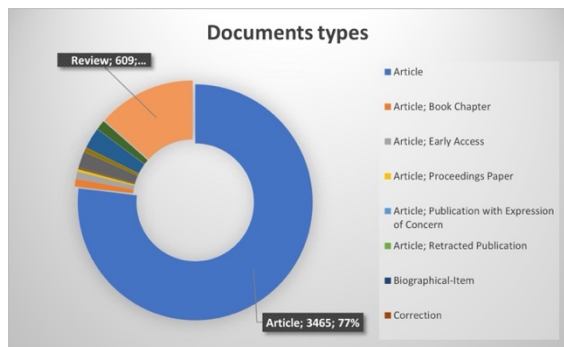


Figure 2. Documents types

According to the documents by country/region distribution; the USA (n=1276), Italy (n=549), China (n=475), England (n=391), Germany (n=385) and France (n=328) are at the top as shown in Figure 3 and Figure 4. The institutional distribution of documents is summarized in Figure 5. Institut National De La Sante Et De La Recherche Medicale Inserm (n=214), University of London (n=178), University of Melbourne (n=165), Harvard University (n=157), University of California System (n=149) are in the first place. University College London and Harvard University Medical Affiliates come next. The institutional network map has shown in Figure 6. Documents by research area were as follows Neurosciences Neurology (n=2945), Psychiatry (n=381) Behavioral Sciences (n=306), Pediatrics (n=293), Pharmacology Pharmacy (n=247) (Figure 7).

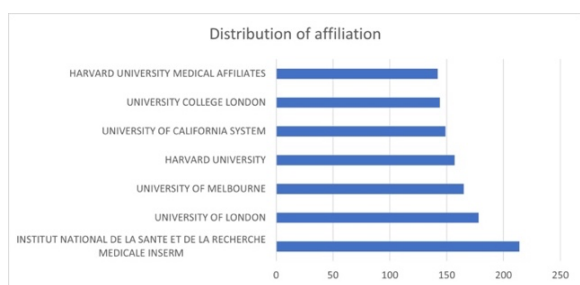


Figure 3. Documents by country

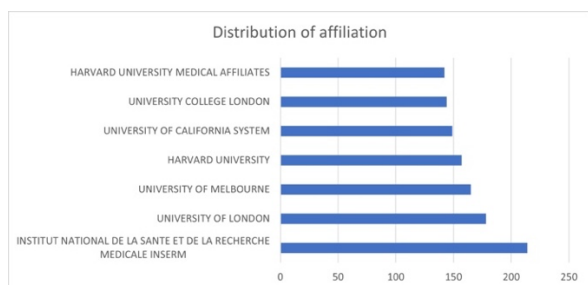


Figure 5. Distribution of affiliation

The United States ranked first in terms of total citation count (n=37434), followed by Italy (n=14811), China (n=5968), England (n=16699) and Germany (n=15027). These countries ranked the top five in terms of citation impact within the literature on absence epilepsy (Table 1). Among a total of 20784 authors identified in the dataset, Pasquale Striano ranked first in terms of publication output, with 62 publications and 2112 citations. Other leading contributors included Scheffer, Ingrid E (53 publications, 8017 citations), Onat Filiz (51, 173), van Luijtelaa, Gilles (48, 892) and O'Brien, Terence (43, 1153) proving both productivity and high impact (Table 2). The international collaboration network and citation network map are shown in Figure 8.

An examination of the citation counts of articles by year reveals that the number of citations, which was 296 in 2015, has shown a steady increase over the years. It is seen that the total number of citations reached 1367 in 2016, 2845 in 2017, 4081 in 2018, 5751 in 2019, 8001 in 2020, 10,018 in 2021, 10,819 in 2022, 11,162 in 2023, 12,228 in 2024 and 12,320 in 2025 (Figure 9).

Table 1. Top countries by publications and citations in absence epilepsy research

Countries	Publications	Total Citations
USA	1276	37434
Italy	549	14811
China	475	5968
England	391	16699
Germany	385	15027
France	328	12765
Canada	298	9613
Australia	258	13823
Netherlands	220	9688

Table 2. Top authors by publications and citations in absence epilepsy research

Authors	Publications	Total Citations
Striano P	62	2112
Scheffer IE	53	8017
Onat F	51	173
Van Luijtelaa G	48	892
O'brien TJ	43	1153
Moller RS	37	2155
Citraro R	33	872
Russo E	33	880
Guerrini R	31	1341
Helbig I	29	1858



Figure 7. Documents by research area

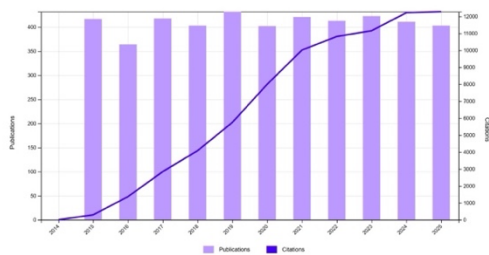


Figure 9. Display of times cited and publications over time

Discussion

Absence epilepsy is common in childhood. Because of significant prevalence of disease and its possible long-term consequences, additional research is needed. Absence epilepsy is characterized by seizure types characterized by clinical findings and EEG characteristics. Absence epilepsy can impair cognitive function and lead to academic and other functional difficulties. Therefore, early diagnosis and intervention tailored to the specific needs of children at risk for neuropsychological problems are crucial. The selection of antiepileptic drugs is crucial for treatment. A better understanding of the genetic and pathophysiological aspects of pharmacological trials is essential for the disease. Therefore, a systematic approach is needed.^{1,8,9}

Bibliometric analysis helps literature studies by providing a comprehensive perspective.¹⁰ This bibliometric analysis aimed to reveal trends in the literature, research dynamics and global contribution distribution by examining scientific studies produced in the field of "absence epilepsy" between 2015 and 2025. The findings have shown that interest in elucidating the mechanisms of absence epilepsy has increased over the last decade. A gap in this research area appears to have occurred during the years of the global pandemic.

Author-based analyses suggest that studies on absence epilepsy are clustered around specific researchers, and the volume of academic output is shaped by the leadership of a specific expert group. This could be interpreted as a natural reflection of absence epilepsy being a relatively narrow subfield. However, international collaboration networks have been observed to be expanding, and researchers from different countries tend to conduct joint studies. Collaboration, particularly between groups based in Europe and epilepsy research centers in the United States, has been observed to be increasing in frequency. Furthermore, it is apparent that Turkey-based groups are collaborating with Europe-based groups. Country-based productivity data reveal that countries with high research capacity dominate the literature, but Asia and the Middle East have also experienced a noticeable increase in recent years.

The results as presented at the distribution of article types, we see that original research articles constitute the majority of the literature. This suggests that studies on experimental animal models and neurochemicals became dominant during this period. Although the number of review articles was lower, the increase,

particularly after 2020, can be interpreted as a sign that the field's knowledge base is maturing and that themes within the field have formed a compilable body of knowledge. This trend leads us to assume that more comprehensive studies are emerging that synthesize both pathophysiological and treatment-oriented information. The increasing number of studies and citations in this field in recent years supports the high interest in this field. These articles are mostly written in English, with the United States, Italy and China in the first rank. We see that the first three institutions with the most publications are Institut National De La Sante Et De La Recherche Medicale Inserm, University of London and University of Melbourne. Moreover, Türkiye-based the Istanbul University group may not be among the ten most productive teams, it seems to appear to play a significant role in the research network. This impact extends beyond the number of publications and may be attributed to its central role in citation and collaboration networks.

When the authors who have contributed the most to the field in the last 10 years are evaluated, Striano Pasquale is in first place with 62 publications, Ingrid E Scheffer is in second place with 53 publications and Filiz Onat is in third place with 51 publications.

These results demonstrate that research on absence epilepsy gained significant momentum between 2015 and 2025, with global collaborations strengthening and basic science findings becoming more integrated with clinical perspectives. These findings suggest that the field will advance further in the future through more systematic data sharing, larger sample sizes of clinical trials, and the implementation of technological innovations.

This study included plenty of limitations. First of all, analyses were based on only published articles that were included in the WoS database. The main subject here was the inability to combine data from multiple databases for analysis in VOSViewer. In this study, the search strategy was based on the term 'absence epilepsy'. However, field-specific searches with specialized keywords could provide further insights into developing research trends and progressive patterns within the topic of the study.

To best of our knowledge, this is the first bibliometric analysis conducted on absence epilepsy. This study provides a comprehensive summary of 4,507 articles on absence epilepsy published in WoS up to December 30, 2025. Furthermore, the countries and institutions with the most relevant studies on absence epilepsy are included. Our study serves as a guide for researchers planning to study absence epilepsy.

Conflict of interest

The authors declare that they have no conflicts of interest.

Ethics Committee Statement

None.

Author Contributions

GT; Conception, fundings, none-materials, data collection and/or processing, literature, AK, TU; Supervision, review,

critical review, GT, AK, TU; Design, analysis and/or interpretation, writing.

Data Availability Statement

All bibliographic data used in this study was obtained from relevant academic databases (Web of Science) using standard search strategies. Due to copyright and database license restrictions, the raw dataset cannot be shared directly. However, the search terms, inclusion/exclusion criteria, and analysis steps used in the study are detailed in the article. The processed data, analysis outputs, and codes used in the study are available from the corresponding author upon reasonable request.

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