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Original Article

Quality of Life in Children with Epilepsy: A Bibliometric Analysis

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Abstract

Objective: The aim of this study was to explore research related to the quality of life (QOL) of children with epilepsy using bibliometric analysis.

Methods: This study used the Web of Science Core Collection database. Articles in this widely used globally database were searched on February 14, 2024, using the following keywords: ("epilepsy" or "seizure" or "convulsion" or "epileptic" or "status epilepticus") and ["quality of life" or "QOL" or "life quality" or "health related quality of life (HRQOL)" or "health-related quality of life" or "HRQOL"] and ("children" or "child" or "childhood" or "infant" or "adolescent").

Results: This study, conducted in 1991, on the QOL of children with epilepsy, revealed that 1,810 articles in English had been published in this domain. Examination of citations of research in this field revealed that the most cited article was "Definition of drug resistant epilepsy: consensus proposal by the ad hoc Task Force of the International League Against Epilepsy Commission on Therapeutic Strategies". Examination of inter-country collaborations in studies on the subject revealed that the United Kingdom and the United States of America (USA) engaged in the most collaborations. Specifically, the United Kingdom collaborated most with the USA (n=69), followed by Italy (n=31), France (n=30), Germany (n=29), and the Netherlands (n=28).

Conclusion: Our scan of the literature revealed no previous bibliometric studies in which the subject of QOL in pediatric epilepsy patients was addressed. This bibliometric study analyzed sources, authors, researchers, institutions, links, countries, keywords, topics, and themes, investigating epileptic children's QOL.

Keywords: Epilepsy, seizure, convulsion, quality of life, children, adolescent, bibliometric analysis

INTRODUCTION

Epilepsy is a common neurological condition marked by seizures. It affects individuals from diverse age groups and cultural backgrounds. The fourth highest contributor to disability among 220 separate health issues, severe epilepsy can be devastating. Its adverse consequences extend to the social and professional spheres, and to physical and mental well-being.[1] Quality of life (QOL) is highly important in chronic conditions such as epilepsy. The World Health Organization characterizes QOL as "a condition of holistic health encompassing physical, mental, and social well-being, rather than just the absence of illness or weakness".[2] QOL is a multifaceted construct that encapsulates both the positive and negative facets of an individual's life, reflecting overall well-being. From that perspective, QOL extends beyond the mere assessment of physical health to encompass diverse areas such as family dynamics, educational attainment, work status, financial prosperity, personal freedoms, environmental considerations, and security in both the personal and financial spheres.[3,4] Variables affecting QOL include age, place of residence, socioeconomic status, maternal educational background, seizure characteristics such as type and frequency, and the quantity of antiepileptic medications used.[5] Health-related QOL (HRQOL) is also a multifaceted concept involving aspects of social, emotional, and physical functioning or well-being, which are related to the individual's health status.[6] There are also studies showing that QOL is adversely affected in children with epilepsy.[7-9]

The bibliometric analysis employed in this study is a highly comprehensive quantitative method. Such analysis makes it possible to determine the authors of studies on a specific topic, the institutions and countries where those authors work, the most cited publications, and the keywords used. Bibliometric analysis serves as an important tool not only for understanding previous research but also as a guide to future studies by identifying potential areas of investigation.[10]

Our review of the relevant literature revealed that while bibliometric analyses have been conducted on research focusing on children with epilepsy, there has been no bibliometric analysis specifically addressing these children's QOL.[11-13] The purpose of this research was to examine studies on the QOL of such children from a bibliometric perspective and to determine missing elements, along with data concerning life and treatment, that have not previously been investigated.

The aim of this study was, therefore, to explore research related to the QOL of children with epilepsy using bibliometric analysis. The investigation was structured around the following questions:

1. What patterns emerge in terms of publication output, country distribution, journal sources, and authorship within this field of research?

2. Which topics and subjects generate the most extensive investigation into QOL among children diagnosed with epilepsy?

3. What gaps or under-explored areas currently exist in the study of the QOL of children living with epilepsy?

METHODS

Data Collection

This study used the Web of Science (WOS) Core Collection database. Articles in this widely used database were searched on February 14, 2024, using the following keywords: topic search (TS) = ("epilepsy" or "seizure" or "convulsion" or "epileptic" or "status epilepticus") and TS = ("quality of life" or "QOL" or "life quality" or "health related quality of life" or "health-related quality of life" or "HRQOL") and TS = ("children" or "child" or "childhood" or "infant" or "adolescent"). Original research articles published in English between 1991 and 2024 in the Social Sciences Citation Index (SSCI) and the Science Citation Index Expanded (SCI-EXPANDED) were selected.

When the keywords were entered into WOS, 2,987 results were initially obtained. When the article was selected as the document type, with SSCI and the SCI-EXPANDED as the WOS index, and with English as the language, the results were narrowed down to 1,810. BibTeX and Tab Delimited File formats were downloaded from the WOS export section, and analyses were conducted on these files.

Statistical Analysis

This research used R software to analyze and present bibliometric data sourced from the WOS database. While several software options are available for conducting bibliometric analysis and visualization, the selection hinges on the particular analysis requirements.[14] Bibliometrix is a commonly used tool among bibliometricians due to its R programming capabilities. Bibliometrix offers several advantages, such as rapid updates and seamless compatibility with other statistical R-packages.[15] It streamlines the tasks of importing and converting data into R data frames and its integration with WOS facilitates the automatic retrieval of metadata for the entire scientific output of academics.[14,15] Biblioshiny is employed for bibliometric analysis, including science mapping and performance evaluation. Serving as a web interface for bibliometrix (https://www.bibliometrix.org), Biblioshiny simplifies various tasks, such as importing data, converting these into data frames, filtering data, conducting analytics, and generating plots related to sources, authors, and documents.[16] This research also used VOSviewer for its analyses. VOSviewer employs both mapping and clustering methods to visualize connections among terms present in research. This software groups cited words together and exhibits them using different colors, with circle sizes indicating how frequently the information appears.[17]

MAIN POINTS

- This bibliometric study analyzed sources, researchers, institutions, countries, and keywords in the context of investigating the quality of life (QOL) in epileptic children.
- Studies of epileptic children's QOL were most frequently conducted in the United States of America, Canada, and the United Kingdom.
- The journals producing the most publications were Epilepsy and Behavior, Epilepsia, and Seizure-European Journal of Epilepsy.

RESULTS

Main Information

Since 1991, our investigation into the QOL of children with epilepsy revealed that 1,810 articles in English had been published in this domain; cataloged within both SSCI and SCI-EXPANDED, with a total of 7,993 authors involved (Table 1).

General Trend

A linear increase was observed when analyzing the distribution of QOL research concerning children with epilepsy over various years, with the highest number of publications in this field occurring in 2021 (n=164). Since the analyses in the present study were conducted in the first quarter of 2024, the data for that year were not included (Figure 1).

Figure 2, in which keywords, countries, and institutions, where the publications were produced, shows that publications in this field appear to be most frequent in the United States of America (USA), Canada, and the United Kingdom. Keywords such as children, QOL, and childhood epilepsy are predominantly featured.

Table 1. Data information

Main information about data	
Timespan	1991/2024
Sources (journals, books, etc)	384
Documents	1,810
Average years from publication	9.33
Average citations per documents	9.23
Average citations per year per doc	29.92
References	41,808
Document contents	
Keywords plus (Id)	2,809
Author's keywords (De)	3,151
Authors	
Authors	7,993
Authors of single-authored docs	63
Authors collaboration	
Single-authored docs	75
Co-authors per doc	6.15
International co-authorships %	21.6

Journals

Publications concerning QOL in children with epilepsy appeared most frequently in the following journals: Epilepsy and Behavior (n=449), Epilepsia (n=158), Seizure: European Journal of Epilepsy (n=98), Epilepsy Research (n=58), Pediatric Neurology (n=38), and the Journal of Child Neurology (n=35) (Figure 3). Examination of the performance of the journals with the highest numbers of publications in this field shows that the understanding of the importance of QOL in these children has increased since 2007.

We used Bradford's law to examine the journals in which studies on the QOL in children with epilepsy had been published. This demonstrates how research on a particular topic is spread across different journals. According to Bradford's law, zone 1 represents the most prolific area, zone 3 is less productive, and zone 2 falls between the two.[18] Analysis of influential journals focused on the QOL in children with epilepsy showed that the journals Epilepsy and Behavior and Epilepsia lie in zone 1. Articles from other journals within this field were in zones 2 and 3 (Figure 3a).

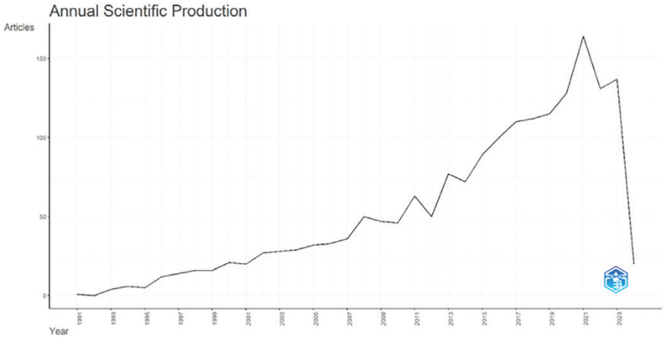

Figure 1. Annual scientific production

Examination of citations of research related to QOL in children with epilepsy revealed that the most cited articles were "Definition of drug resistant epilepsy: consensus proposal by the ad hoc Task Force of the International League Against Epilepsy (ILAE) Commission on Therapeutic Strategies (Kwan et al.[19])", "cost of disorders of the brain in Europe (Gustavsson et al.[20])", and "everolimus for subependymal giant-cell astrocytomas in tuberous sclerosis (Krueger et al.[21])" (Table 2).

Authors, Institutions and Countries

This part of the study examined the authors of articles about QOL in children with epilepsy published in English, on WOS, specifically in SSCI and SCI-EXPANDED. Professor Mary Lou Smith from the Department of Psychology at the University of Toronto in Canada emerged as the most prolific researcher in this field. Associate Professor Mark A Ferro, affiliated with the School of Public Health Sciences at the University of Waterloo, emerged as the second most prolific author, followed by Professor Kathy N Speechley from the Department of Paediatrics at the University of Western Ontario (Table 3, Figure 4).

Lotka's law sub-analysis was also employed in this study. According to this law, which defines the productivity of authors in a particular research field, 60% of authors publish only one article, 15% publish two articles, and 7% publish three articles.[22] Analysis of articles related to the QOL of children with epilepsy using Lotka's law revealed that 81.2% of authors contributed only one article (n=6,546), while 10.6% produced two articles (n=851), and 0.35% produced three (n=279) (Figure 4a). The distribution of authors in the study deviated from Lotka's law.

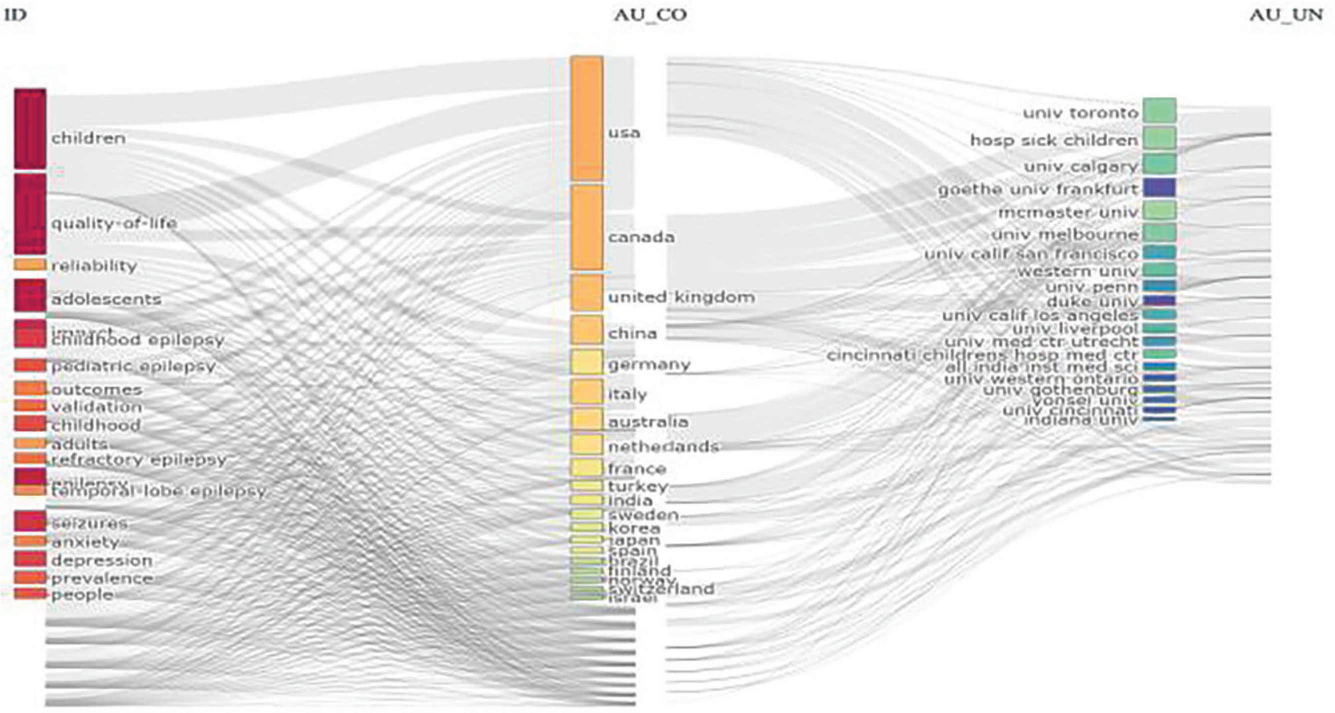

Figure 2. Triple analysis

In terms of the researchers' affiliations, the prime position was occupied by McMaster University, followed by The Hospital for Sick Children in second place, and the University of Toronto in third (Figure 4b).

Analysis of scientific publications by nations identified the leading 10 countries as the USA (n=2,669), Canada (n=1,085), the United Kingdom (n=787), China (n=648), Italy (n=588), Australia (n=471), the Netherlands (n=464), Germany (n=459), France (n=352), and India (n=201) (Figure 4c).

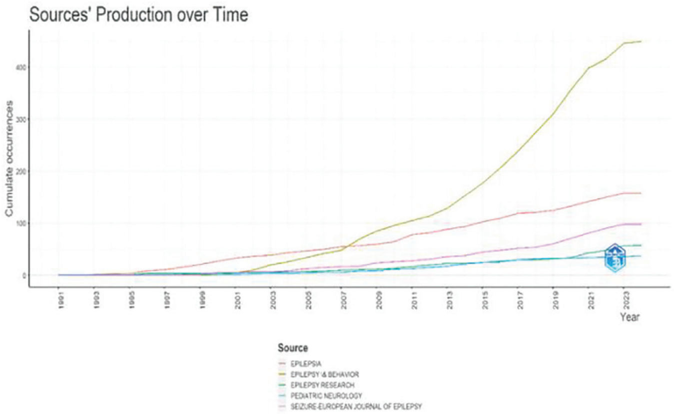

Figure 3. Sources growth

Figure 3. (a) Bradford's law core sources

Table 3. Most relevant authors and authors local impact

Author	h_index	g_index	TC	NP	PY start
Smith ML	19	30	958	38	2000
Ferro MA	16	26	723	37	2010
Speechley KN	15	26	685	31	2008
Modi AC	15	27	745	30	2009
Austin JK	17	22	1,312	22	1994
Ronen GM	14	22	743	22	1999
Reilly C	9	17	314	22	2014
Cross JH	9	21	1,131	21	2009
Widjaja E	9	16	261	21	2013
Baker GA	16	18	1,017	18	1996

PY: Publication year, TC: Total citations, NP: Number of publications

Examination of inter-country collaborations in studies related to the QOL of children with epilepsy revealed that the United Kingdom and the USA engaged in the most activity. Specifically, the United Kingdom collaborated most with the USA (n=69), followed by Italy (n=31), France (n=30), Germany (n=29), and the Netherlands (n=28). Collaborations also occurred between the USA and Canada (n=65); between Italy and France (n=27); and between the USA and Australia (n=25), France (n=24), and Italy (n=22) (Figure 4d).

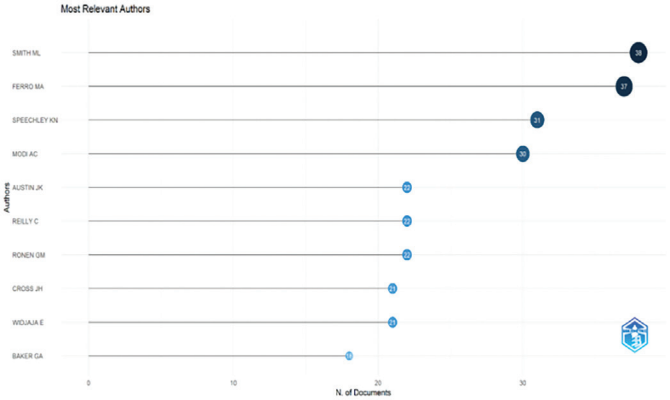

Figure 4. Most relevant authors

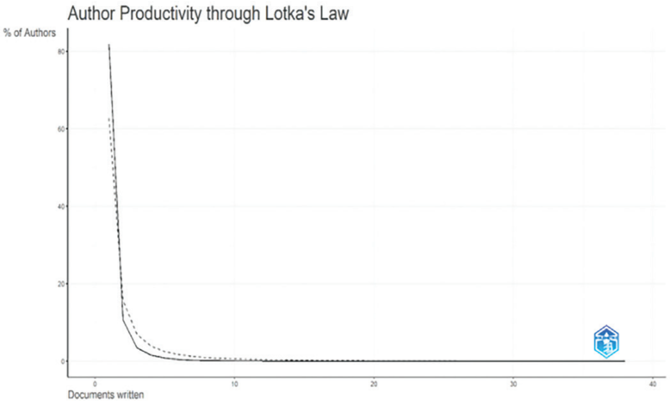

Figure 4. (a) Lotka's law

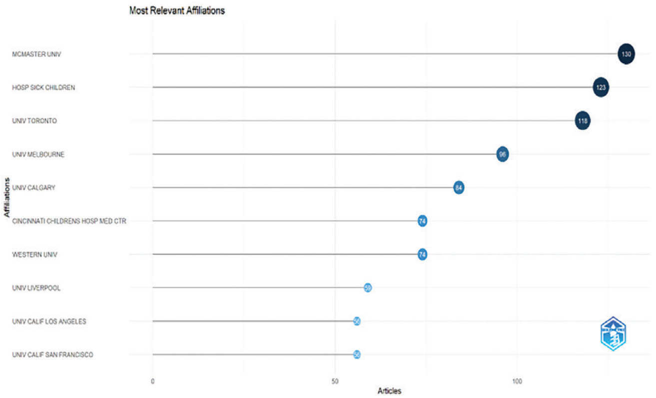

Figure 4. (b) Most relevant affiliations

Keyword and Trend Topic Analyses

This study primarily focuses on subjects related to children, QOL, adolescents, epilepsy, impact, seizures, and childhood epilepsy (Figures 5 and 5a).

Factor analysis of keyword clusters was conducted using multiple correspondence analysis. Four clusters were identified in the selected analysis. In the large group, words such as seizure, epilepsy, parents, QOL, and risk factors were collected. In the second group, terms such as intractable epilepsy, efficacy, long-term, and therapy were grouped together. Measurement evaluation-related words such as questionnaire, scale, validity, and reliability were clustered in the third group. Words such as depression, anxiety, and disorders were grouped together in the fourth group (Figure 5b).

The authors' chosen terms were examined using VOSviewer. From the visual depiction, the colors of the boxes represent both the distribution of keywords and the extent of collaboration between researchers using them. The words in the figure are most closely associated with: "epilepsy" followed by "quality of life" in second place and "children" in third (Figure 5c).

This study also investigated the trend in words used over the years in studies of QOL in children with epilepsy. This revealed that the concepts employed varied over time (Figure 5d).

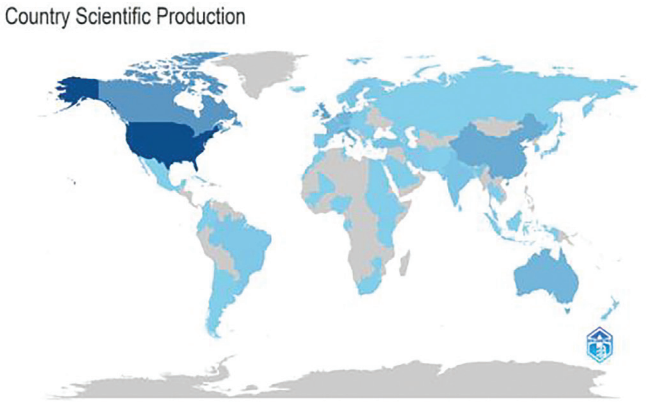
Country Scientific Production

Figure 4. (c) Country scientific map

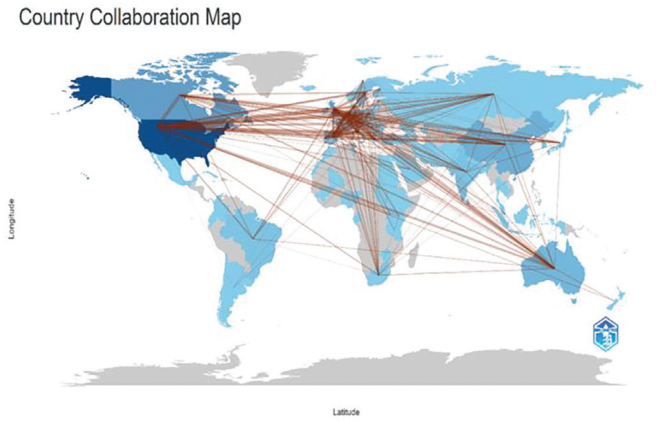
Country Collaboration Map

Figure 4. (d) Country collaboration map

Ethical Approval

The study was conducted as a bibliometric analysis. All data sources were available on the internet, and no animal or human subjects were involved. Ethical committee permission and consent was not required, therefore.

DISCUSSION

Data published over a period of 33 years related to pediatric epilepsy patients and their QOL, including authors, international institutions, journals in the field, references attracting citations, and up-to-date keywords on the subject, were were evaluated in this study using bibliometric-based analysis. The purpose of the research was to achieve a comprehensive understanding of the evolution of the scientific literature concerning the QOL of such children and to evaluate the impact of publications on the scientific community.

Children with epilepsy are affected in the physical, cognitive, psychological, emotional, and social spheres. These effects can best be evaluated by determining the patient's self-reported QOL.[5] The research findings showed that studies of the QOL of children with epilepsy increased from 1991 onward, and that, in terms of annual distributions, the largest number was performed in 2021. Considering that studies published in 2021 were initiated in 2020, we attribute this to the difficulties imposed on children with epilepsy by the COVID-19 pandemic. In addition, the number of studies on the subject decreased rapidly as of 2022 with the end of the pandemic. It may, therefore, be concluded from this study that epilepsy should not be considered solely from the physiological or clinical perspectives. The increase in studies involving children with epilepsy supports the idea that a holistic approach toward the disease is required.

Studies of the QOL of children with epilepsy were most frequently conducted in the USA, Canada, and the United Kingdom. Examination of the distribution of publications showed that developed countries were particularly productive. Countries' economic status has been linked to academic publication productivity in numerous studies.[23] Developing countries among the top 20 nations in terms of publication productivity were Türkiye, India, and Brazil.

Analysis showed that the greatest research collaboration was among developed countries such as the United Kingdom, the USA, Italy, Germany, France, the Netherlands, and Canada. Developed countries possess more research institutions, systematic data systems, and resources for research, and conduct more comprehensive epidemiological studies than less developed ones.[24] It may therefore be expected that the numbers of studies of QOL in children with epilepsy, and collaboration between countries will be higher in developed and more prosperous countries.

The findings of this study show that more than half of the scientific documents published between 1991 and 2024 were original research and review papers. The journals producing the most publications were in descending order, Epilepsy and Behavior, Epilepsia, Seizure-European Journal of Epilepsy, Epilepsy Research, Pediatric Neurology, and the Journal of Child Neurology. All these are competent in their field and publish studies on seizures and epilepsy based on experimental and clinical

Figure 5. Treemap

Figure 5. (a) Wordcloud

research. Unsurprisingly, the majority of the top six sources were neurological journals focusing on epilepsy. As shown by resource alignment analysis and a comparison of the H index, Epilepsy and Behavior, is also the fastest-growing and highest-impact resource.[25] Bradford's law identified Epilepsy and Behavior as the principal basic resource.[26] This finding shows that authors who wish to publish on the subject of QOL of individuals with epilepsy should consider submitting their work to that particular journal.

Analysis of the number of yearly citations in the different journals, showed that the most frequent, in descending order of frequency, were: Epilepsia, European Neuropsychopharmacology, The New England Journal of Medicine, and Nature Reviews: Disease Primers. Interestingly, with the exception of Epilepsia, the journals with the most publications in this field and those with the most citations were not one and the same. We believe that this may be attributable to the journals' different content distributions.

The study with the highest total number of citations was Kwan et al.[19] 2010 paper "Definition of drug-resistant epilepsy: consensus proposal by the ad hoc Task Force of the ILAE Commission on Therapeutic Strategies," which was published in Epilepsia.[19] In that study, the ILAE appointed a working group to produce a common definition of drug-resistant epilepsy for the purpose of improving patient care and facilitating clinical research. The general framework of this definition has two hierarchical levels. The logic behind the definition and the principles guiding correct use were discussed, and examples of its application in clinical practice were provided.[19] Although epilepsy is treatable, 30% of patients with the condition develop drug resistance, resulting in uncontrolled seizures that further compromise their QOL.[27] The frequency of seizures also has a significant impact on the QOL of patients with epilepsy. When seizures are well controlled in epileptic individuals, their QOL scores have been found to be similar to those of the general population.[28] That article also emerged as the most effective in terms of average annual citation numbers.[19] Patients with epilepsy are exposed to a range of HRQOL issues, irrespective of whether their seizures are well controlled, including limitations in employment and social opportunities, perceived stigma, psychological pathologies including anxiety and depression, problems with marriage and family life, memory problems, and other cognitive impairments.[29] The paper receiving the second highest number of total citations was Gustavsson et al.[20] study "Cost of Disorders of the Brain in Europe 2010" published in European Neuropsychopharmacology. That study emphasized that the cost of brain disorders in 27 European Union countries, as well as Norway, Iceland, and Switzerland, was 798 billion Euros per year, and that the cost burden corresponded to 25% of direct health spending.[20] Epilepsy is more frequently seen in low- and middle-income countries.[30] Access to epilepsy care in such countries is problematic due to constraints in both the supply and demand sides

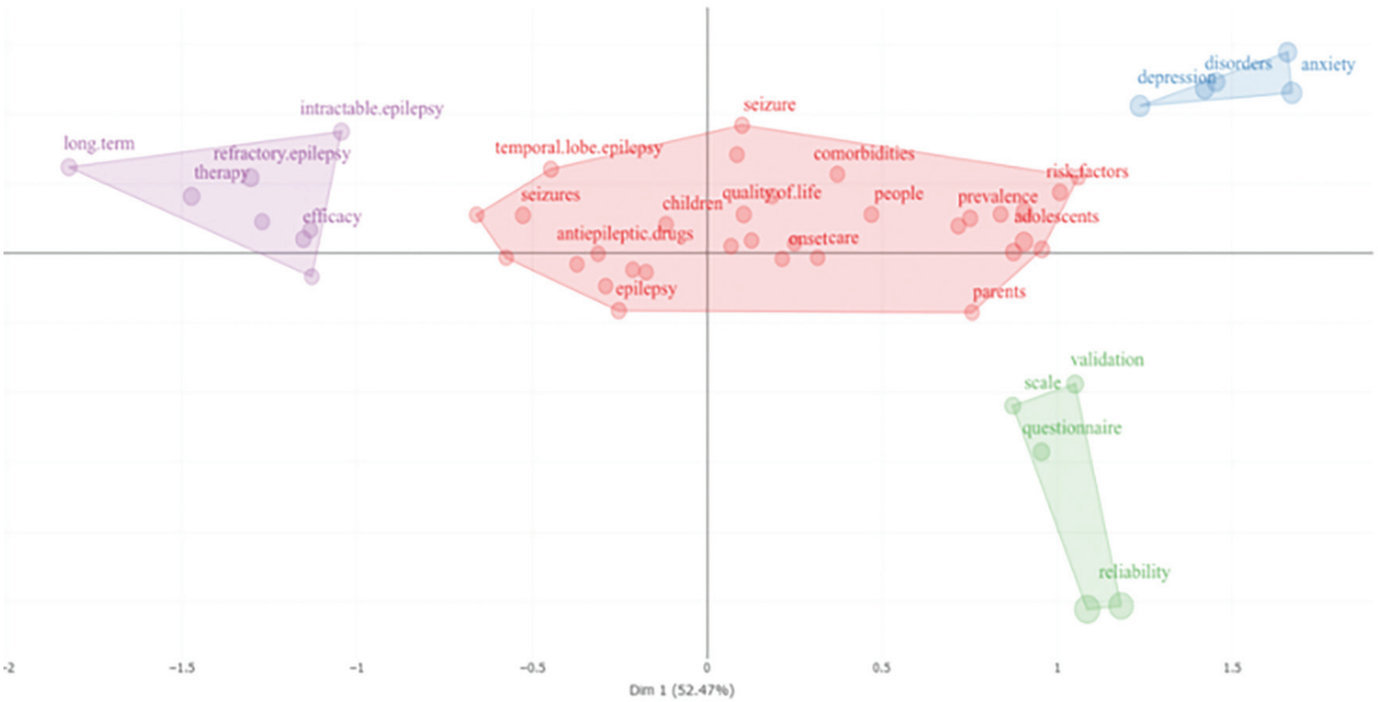

Figure 5. (b) Keyword plus conceptual structure map of publications

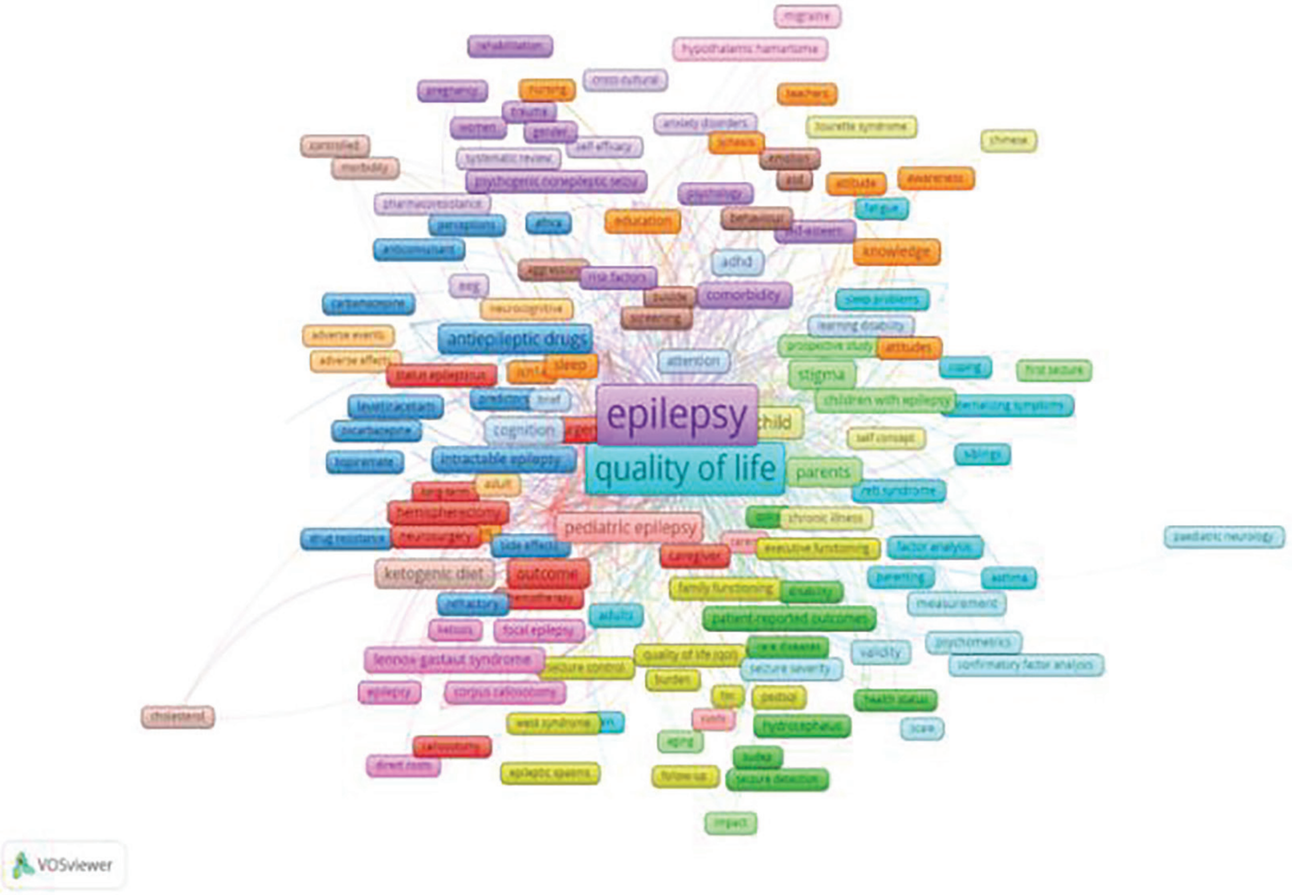

Figure 5. (c) Authors' keywords collaboration

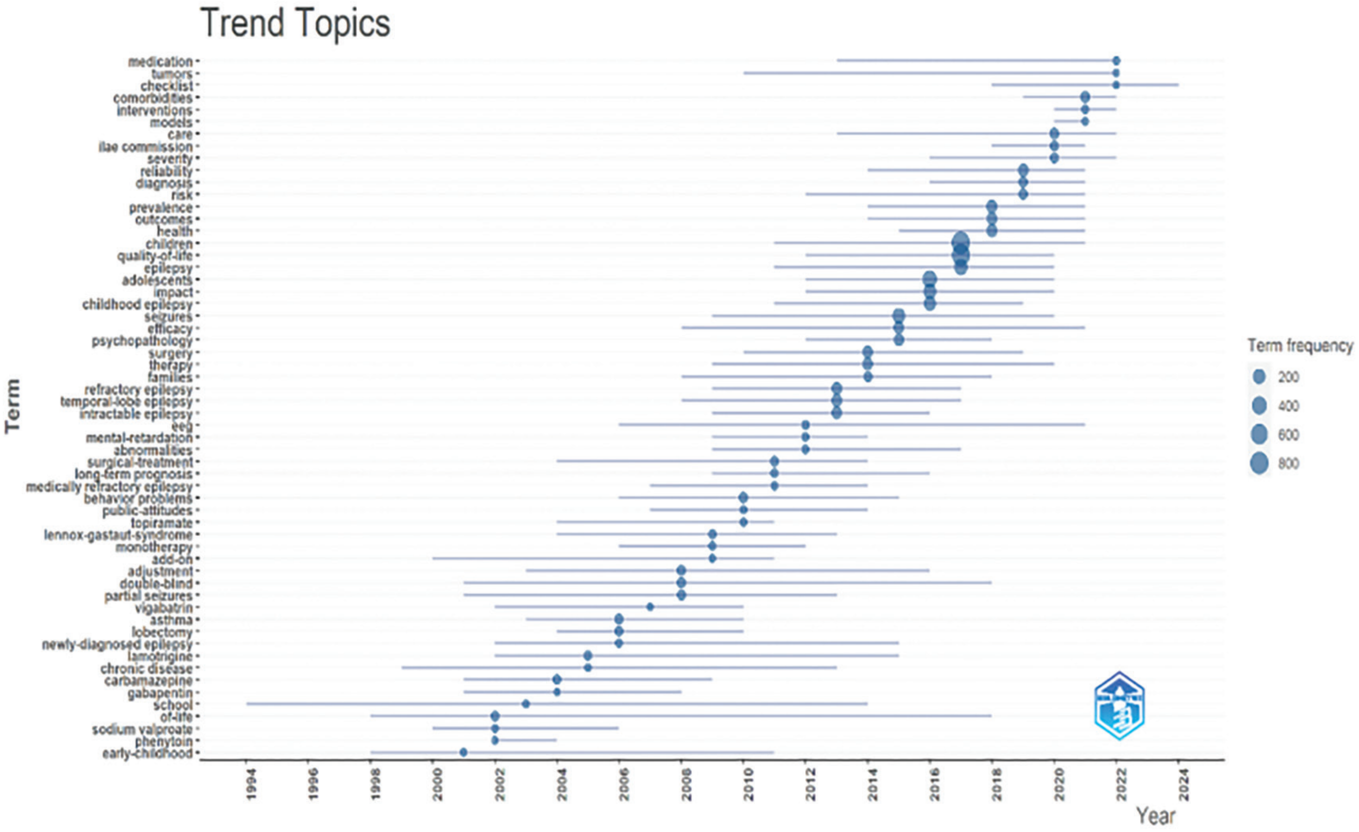

Figure 5. (d) Trend topics

(distances to healthcare facilities, lack of medical care; shortages of antiepileptic drugs, cultural beliefs concerning epilepsy and traditional treatments, and treatment costs). In addition to these factors, the condition can also lead to psychological stress and low self-esteem, resulting in non-compliance with epilepsy treatment. Lack of adherence to treatment results in recurrence of seizures, status epilepticus, hospital admissions, and increased health care utilization, which can impact significantly on QOL.[31-33] This study further highlights the multifaceted effects of epilepsy on human life, especially its relationship to the economic burden on society. However, examination of the keywords in the studies evaluated in this research shows the breadth of the perspective toward epilepsy, including treatment, comorbidity, prognosis and etiology. Evaluation of the distribution of keywords in this research, using factor analysis, showed that the largest keyword factors were types of epilepsy, seizure, risk factors, QOL, parents, and children and adolescents. QOL is a complex and multi-dimensional concept that determines the individual's general state of well-being. In addition to physical health, this concept contains numerous elements such as education, work, wealth, freedom, and environmental aspects, and evaluates numerous elements such as personal and financial security.[34] An association has been observed between the QOL of children with epilepsy and the presence of comorbidities. Children with comorbidities exhibit significantly lower QOL in the areas of physical and social functioning, psychosocial health, and school/educational functioning.[35] Examination of other factors highlights that psychiatric disorders such as depression and anxiety are grouped in a single group. Irrespective of their age, patients with epilepsy are known to suffer from depression and anxiety.[36] Epilepsy poses a severe burden on patients, parents, and society. Disease-specific restrictions can impact areas such as the individual's self-efficacy and mobility. Additionally, epilepsy has been linked to a decreased QOL and increased depression scores.[34] The psychiatric comorbidities experienced by children with epilepsy include attention deficit hyperactivity disorder, as well as anxiety and depression. The co-presence of neurodevelopmental disorders can make it difficult to diagnose psychiatric comorbidities in children with epilepsy.[37] Regular assessments of psychiatric problems associated with epilepsy can enhance the efficacy of therapeutic processes. The early identification of such problems will improve the likelihood of intervention.

Trend and content analysis of studies on the QOL of children with epilepsy showed that the most frequently employed words were "children" and "adolescents". This indicates that epilepsy is an important disease affecting the QOL of children and adolescents. The third most commonly employed keyword in research was "quality of life." The use of that term increased continuously since 2012. Other frequently used keywords included "epilepsy" and "seizures". Terms such as "comorbidities" and "psychopathology" show that psychiatric problems seen together with epilepsy have been the subject of considerable research. It has been stated that the quality of life of children with epilepsy is mostly affected by social support and depressive mood. In this context, knowing this information can help children and their families achieve a better quality of life.[38] The keywords "outcomes" and "efficacy" reveal how the therapeutic process in epilepsy and the effectiveness thereof affects QOL. It is important to consider QOL in pediatric epilepsy cases from that perspective and to adopt a transdisciplinary and multidisciplinary approach. It is important for health professionals who focus on children to adopt a holistic approach toward children with epilepsy by participating actively in the treatment process. Including QOL evaluations in treatment planning may help children better understand their general condition. Examining the factors impacting QOL may contribute to improving the therapeutic process. Considering QOL evaluations in treatment planning can also contribute to improving the efficacy of treatment. Monitoring the general development of children with epilepsy, implementing supportive intervention programs, and increasing training for parents and teachers can also improve the QOL of such children.

Study Limitations

The principal limitations of this research are the inability to screen databases such as Scopus, EMBASE, PubMed, Google Scholar, and Dimensions, and the exclusive use of English search terms, which prevented a comprehensive evaluation using terms in other languages.

CONCLUSION

Our scan of the literature revealed no previous bibliometric studies in which the subject of QOL in pediatric epilepsy patients was addressed by itself. The present bibliometric study analyzed sources, authors, researchers, institutions, links, countries, keywords, topics, and themes investigating the QOL in epileptic children. Research over the last two decades has reported significant advances in QOL for children with epilepsy, as well as in the process of obtaining information directly from these children and their families. We hope that this article will serve as a useful guide for both physicians and pediatric epilepsy patients and their families concerning the global interactions between pediatric epilepsy and QOL. This will enable researchers to plan new investigations into QOL in children with epilepsy by examining existing literature. Studies of the QOL of children with epilepsy have made important contributions to the relevant literature, although there are also some gaps or inadequately addressed issues. For example, difficulties in the field of education experienced by children with epilepsy affect their QOL both directly and indirectly. From that perspective, more research is needed into difficulties experienced in school life and the measures that can be adopted to overcome them. Although psychiatric comorbidities have been investigated, it will be useful for further studies to address areas such as social relationships, family and peer relationships, and stigmatization. Comparative studies may also yield a better understanding of the effects of therapeutic methods on QOL. The scarcity of studies on the subject of physical functionality, an important component of QOL, was particularly striking. Finally, further research is needed into physical functioning and activity, to understand which also affect the QOL of children with epilepsy.

Table 2. Most cited articles[19,20,21,39-55]

No	Paper (DOI)	Author	PY	Journal	Total citations	TC per year
1	Definition of drug resistant epilepsy: consensus proposal by the ad hoc Task Force of the ILAE Commission on Therapeutic Strategies (10.1111/j.1528-1167.2009.02397.x)	Kwan et al.[19]	2010	Epilepsia	2908	193.87
2	Cost of disorders of the brain in Europe 2010 (10.1016/j.euroneuro.2011.08.008)	Gustavsson et al.[20]	2011	European Neuropsychopharmacology	1101	78.64
3	Everolimus for subependymal giant-cell astrocytomas in tuberous sclerosis (10.1056/NEJMoa1001671)	Krueger et al.[21]	2010	The New England Journal of Medicine	717	47.80
4	Effect of cannabidiol on drop seizures in the Lennox-Gastaut syndrome (10.1056/NEJMoa1714631)	Devinsky et al.[39]	2018	The New England Journal of Medicine	550	78.57
5	The proxy problem: child report versus parent report in health-related quality of life research (10.1023/A:1008801802877)	Theunissen et al.[40]	1998	Quality of Life Research	507	18.78
6	Cerebral palsy (Primer) (10.1038/nrdp.2015.82)	Graham et al.[41]	2016	Nature Reviews: Disease Primers	429	47.67
7	A comparative study of impairment of quality of life in children with skin disease and children with other chronic childhood diseases (10.1111/j.1365-2133.2006.07185.x)	Beattie and Lewis-Jones[42]	2006	British Journal of Dermatology	369	19.42
8	Cerebral palsy (10.1016/S0140-6736(13)61835-8)	Colver et al.[43]	2014	Lancet (London, England)	338	30.73
9	Surgery for drug-resistant epilepsy in children (10.1056/NEJMoa1615335)	Dwivedi et al.[44]	2017	New England Journal of Medicine	336	42.00
10	Prevalence and health impact of developmental disabilities in US children (Not available)	Boyle et al.[45]	1994	Pediatrics	325	10.48
11	The impact of epilepsy from the patient's perspective I. Descriptions and subjective perceptions (10.1016/S0920-1211(00)00126-1)	Fisher et al.[46]	2000	Epilepsy Research	321	12.84

Table 2. Continued

No	Paper (doi)	Author	PY	Journal	Total citations	TC per year
12	Uncovering the neurobehavioural comorbidities of epilepsy over the lifespan (10.1016/S0140-6736(12)61455-X)	Lin et al.[47]	2012	The Lancet	313	24.08
13	Efficacy of felbamate in childhood epileptic encephalopathy (Lennox-Gastaut syndrome) (10.1056/NEJM199301073280105)	Felbamate Study Group[48]	1993	New England Journal of Medicine	305	9.53
14	Neuro-QOL: quality of life item banks for adults with neurological disorders: item development and calibrations based upon clinical and general population testing (10.1007/s11136-011-9958-8)	Gershon et al.[49]	2012	Quality of Life Research	246	18.92
15	International consensus clinical practice statements for the treatment of neuropsychiatric conditions associated with epilepsy (10.1111/j.1528-1167.2011.03276.x)	Kerr et al.[50]	2011	Epilepsia	243	17.36
16	Successful surgery for epilepsy due to early brain lesions despite generalized EEG findings (10.1212/01.wnl.0000266386.55715.3f)	Wyllie et al.[51]	2007	Neurology	241	13.39
17	Depression and anxiety disorders in pediatric epilepsy (10.1111/j.1528-1167.2005.43604.x)	Caplan et al.[52]	2005	Epilepsia	239	11.95
18	Report of a parent survey of cannabidiol-enriched cannabis use in pediatric treatment-resistant epilepsy (10.1016/j.yebeh.2013.08.037)	Porter and Jacobson[53]	2013	Epilepsy and Behavior	230	19.17
19	Evidence-based guideline update: vagus nerve stimulation for the treatment of epilepsy (10.1212/WNL.0b013e3182a393d1)	Morris et al.[54]	2013	Neurology	217	18.08
20	The treatment of epilepsy in developing countries: where do we go from here? (Not available)	Scott et al.[55]	2001	Bulletin of the World Health Organization	214	8.92

PY: Publication year, TC: Total citations

Ethics

Ethics Committee Approval: The study was conducted as a bibliometric analysis. All data sources were available on the internet, and no animal or human subjects were involved. Ethical committee permission was not required, therefore.

Informed Consent: Patient consent is not required.

Footnotes

Authorship Contributions

Concept: K.M.K., H.A., Design: K.M.K., H.A., Data Collection or Processing: K.M.K., Analysis or Interpretation: K.M.K., Literature Search: K.M.K., H.A., Writing: K.M.K., H.A.

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