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Review

Bibliometric Analysis: Mapping the Global Research Landscape of Inflammation in Bipolar Disorder

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ABSTRACT

Bipolar disorder (BD) is a chronic psychiatric condition characterized by recurrent episodes of mania, hypomania, and depression. Emerging evidence suggests that inflammation plays a critical role in the pathophysiology of BD, with elevated levels of pro-inflammatory cytokines and systemic immune dysregulation implicated. Despite growing interest, there is no comprehensive bibliometric analysis focusing on bipolar disorder and inflammation. A bibliometric analysis was performed using the Web of Science Core Collection (WOSCC) database, encompassing publications from inception to 2024. VOSviewer was utilized to analyze key trends, including publication dynamics, influential authors, citation patterns, keyword co-occurrences, and co-authorship networks. A total of 2,530 publications were identified, including 1,812 original articles and 718 reviews, demonstrating exponential growth since 2015. The United States, Brazil, and Canada emerged as the leading contributors, with significant output from institutions such as the University of Toronto and Deakin University. Influential authors included Michael Berk, Roger McIntyre, and Michael Maes. Research focused on keywords such as "cytokines", "neuroinflammation", and "oxidative stress", while emerging topics like "gut microbiota" and "neuroprogression" indicate evolving research priorities. Citation burst analysis highlighted significant advancements in inflammatory biomarkers and novel therapeutic approaches. However, global collaboration networks remain limited, particularly in underrepresented regions. This bibliometric analysis highlights the increasing interest in inflammation's role in BD and identifies key contributors, research trends, and emerging directions. Future research should prioritize international collaboration, systemic and molecular mechanisms, and translational efforts to improve diagnostics and treatment. These findings provide a roadmap for advancing research on bipolar disorder and inflammation.

INTRODUCTION

Bipolar disorder (BD) is a chronic and severe mental health condition characterized by alternating episodes of mania, hypomania, and depression, significantly impairing psychosocial functioning and reducing life expectancy.[1,2] Affecting approximately 1-2% of the global population, BD contributes substantially to the global burden of mental health disorders.[3] In recent years, inflammation has emerged as a critical focus in the study of BD's pathophysiology. Inflammatory markers, including interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-alpha), and C-reactive protein (CRP), are frequently elevated in individuals with BD.[4] These findings underscore the role of systemic inflammation in disease progression and highlight its potential as a therapeutic target.

The relationship between inflammation and psychiatric disorders, including BD, has garnered increasing attention. Immune-inflammatory pathways are now recognized as central to the pathophysiology of mood disorders and other psychiatric conditions. Elevated levels of pro-inflammatory cytokines, such as IL-6 and TNF-alpha, have been documented not only in BD but also in major depressive disorder (MDD) and schizophrenia, suggesting shared underlying mechanisms.[5-7] Additionally, studies suggest that neuroinflammation, microglial activation, and altered cytokine networks modulate neuronal-glial plasticity and mood regulation, further elucidating inflammation's role in psychiatric conditions.[8] Beyond biological mechanisms, environmental and stress-related factors, including childhood maltreatment, play significant roles in BD pathophysiology. Early-life adversity has been linked to heightened inflammatory responses and an increased risk for severe psychiatric outcomes, underscoring the complex interplay between environmental and biological factors. Advances in molecular and epigenetic research further highlight these processes, paving the way for novel therapeutic strategies. Interventions such as anti-inflammatory agents and rapid-acting treatments, including ketamine, show promise in addressing treatment-resistant cases of mood disorders.[9]

Inflammation's role in the pathophysiology of BD underscores the importance of identifying and synthesizing key research findings in this evolving field. With the increasing volume of studies exploring immune-inflammatory pathways, bibliometric analysis offers a systematic approach to uncover patterns, trends, and gaps in the literature, providing valuable insights for advancing research and clinical applications. While several bibliometric analyses have examined "bipolar disorder" and "inflammation" independently, none have comprehensively explored their intersection.[10-12]

A bibliometric analysis provides a quantitative and qualitative overview of the research landscape, identifying key authors, countries, institutions, journals, and trends. This study aims to address this gap by conducting a comprehensive bibliometric analysis of publications on bipolar disorder and inflammation, offering a roadmap to advance the field and identify emerging research priorities.

MATERIALS AND METHODS

Data Acquisition and Search Strategy

Bibliometric analysis requires comprehensive and reliable data sources. For this study, the Web of Science Core Collection (WOSCC) database was exclusively selected. This methodological decision was based on WOSCC's status as a gold standard for bibliometric research, which provides highly structured, clean, and consistent metadata essential for the accurate construction of co-authorship, co-occurrence, and citation networks in VOSviewer.[13,14]

While other databases like Scopus offer broader coverage and PubMed provides deep clinical focus, WOSCC is renowned for its rigorous journal selection process and detailed citation data, making it the optimal choice for analyzing the structure and impact of an established research field.

The bibliometric data for this study were retrieved from WOSCC on November 29, 2024. Relevant literature was identified using the search strategy: (TS = ("bipolar disorder") AND TS = ("inflammation" OR "inflammatory")). This query was designed to be specific yet comprehensive, targeting the direct intersection of the two core concepts. The 'TS' (Topic) tag searches the Title, Abstract, and Keywords fields, providing a balance between specificity and sensitivity, and capturing papers that explicitly link the two fields. We opted not to include terms for specific biomarkers (e.g., 'IL-6', 'CRP') in the primary search to avoid excluding broader conceptual or review articles.

The search was conducted without any restrictions on publication type to capture the complete landscape, including both original research articles and reviews. All relevant data were exported in plain text format, including full records and cited references, for further analysis. It is important to note that all analyses were conducted on this exported bibliographic metadata (titles, abstracts, keywords, author information, etc.). Full-text content analysis of the articles was not performed, as is standard for bibliometric mapping.

Data Analysis

Bibliometric analysis was performed using VOSviewer, a widely adopted tool for mapping and visualizing bibliometric networks.[15] It enables the identification of clusters and relationships among authors, institutions, and keywords through color-coded node mapping.[16] In this study, VOSviewer was used to generate co-authorship networks to examine collaboration patterns, and keyword co-occurrence networks to identify thematic trends and emerging topics. Additionally, the overlay visualization feature illustrated the temporal evolution of research focus by displaying keyword and author distributions across time.[17]

RESULTS

Publication Trends

A total of 2,530 publications on bipolar disorder and inflammation were identified, comprising 1,812 research articles and 718 review articles. The number of publications has shown an exponential growth rate over the past two decades, with a significant surge in articles between 2015 and 2023. The annual growth rate was calculated at 12.8%, indicating increasing attention to the role of inflammation in bipolar disorder. This was determined using the Compound Annual Growth Rate (CAGR) formula, a standard metric for assessing growth over time.

The formula was applied to the study period as follows: CAGR = [((End Value / Start Value) ^ (1 / n)) – 1]*100. ('Start Value' and 'End Value' are the publication counts in the first and last year of the analysis period, and 'n' is the number of years.)

Most Productive Countries

The United States emerged as the most prolific country, contributing 691 articles (27.3% of total publications), followed by Brazil (282 articles), Canada (273 articles), and China (244 articles). International collaborations were most frequent between the USA and Canada, as well as between the USA and the United Kingdom (Fig. 1).

Most Active Institutions

The University of Toronto led institutional output with 159 publications, followed by Deakin University (134) and the University of Melbourne (119). Other major contributors included the University of London (110), University of Texas System (101), and Florey Institute of Neuroscience and Mental Health (98). South American and European centers such as Universidade Federal do Rio Grande do Sul (95) and INSERM (90) also featured prominently.Institutions with a focus on youth mental health,

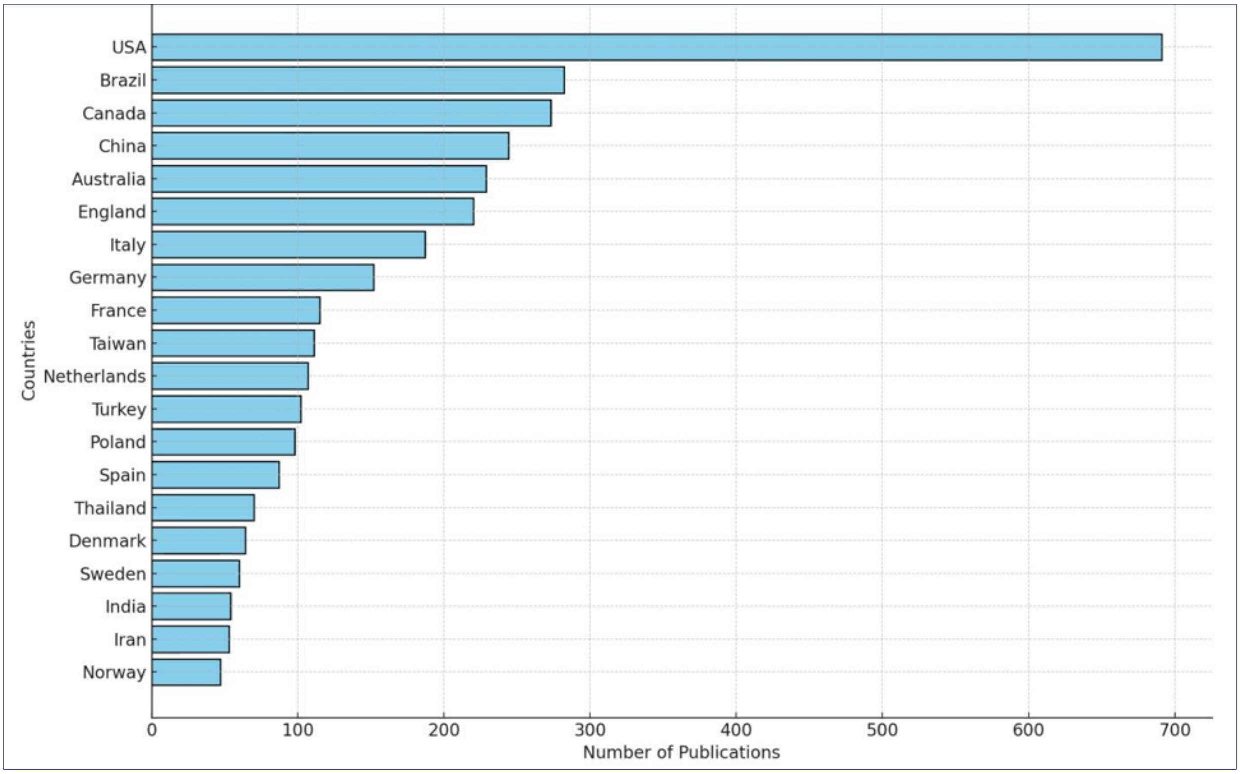

Figure 1. Top 20 countries by number of publications on bipolar disorder and inflammation.

like Orygen (90), and large academic hospitals such as King's College London (80), AP-HP (79), and Johns Hopkins University (75), reflected a diverse research base. Additional contributors included the University of Texas Health Science Center Houston (75), University Health Network Toronto (72), Baylor College of Medicine (71), and University of California System (66). European institutions such as Université Paris-Est Créteil (63), Centre for Addiction and Mental Health (61), and Université Paris Cité (61) completed the top 20. These institutions act as key research hubs, fostering regional and international collaborations that drive the interdisciplinary evolution of this field.

Key Journals

The top 10 journals publishing research on bipolar disorder and inflammation included Journal of Affective Disorders (133 articles), Brain Behavior and Immunity (82 articles), and Frontiers in Psychiatry (94 articles). Most of these journals are classified as Q1 in the Journal Citation Reports (JCR), indicating their high impact in the field (Table 1).

Table 1. Top 10 journals in bipolar disorder and ınflammation research: Articles, Impact Factor (IF), and JCR classification

Ranking	Sources	Articles	Country	IF	JCR-c
1	Journal of affective disorders	133	Netherlands	5.4	Q1
2	Frontiers ın psychiatry	94	Swıtzerland	3.9	Q2
3	Brain behavıor and immunıty	82	USA	9.8	Q1
4	Journal of psychiatric research	68	UK	4.3	Q1
5	Progress in neuro psychopharmacology				
	Biologıcal psychıatry	58	UK	4.9	Q1
6	Translational psychiatry	58	UK	6.3	Q1
7	Psychiatry research	55	Netherlands	5.3	Q1
8	Molecular psychiatry	47	UK	11.1	Q1
9	Bipolar disorders	45	Denmark	5.9	Q1
10	International journal of molecular sciences	38	Switzerland	5.6	Q2

Table 2. Top 10 authors in psychiatric research on bipolar disorder and inflammation: Articles and h-index rankings

Ranking	Authors	Articles	h-index
1	Berk, Michael	98	123
2	McIntyre, Roger	70	98
3	Maes, Michael	69	116
4	Kapczinski, Flavio	59	86
5	Teixeira, Antonio	49	68
6	Leboyer, Marion	45	105
7	Yolken, Robert	41	100
8	Brietzke, Elisa	41	54
9	Mansur, Rodrigo	38	47
10	Dean, Olivia	38	47

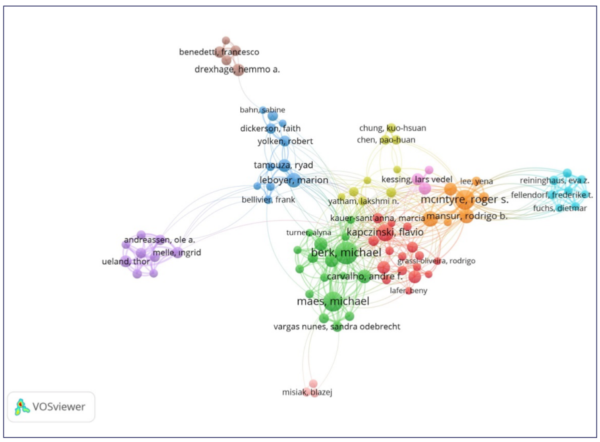

Figure 2. Co-authorship network in bipolar disorder and inflammation research.

Influential Authors

Michael Berk, Roger McIntyre, and Michael Maes were identified as the most prolific authors, contributing 98, 70, and 69 articles, respectively (Table 2).

The co-authorship analysis revealed distinct clusters of researchers actively contributing to the field of bipolar disorder and inflammation. Using VOSviewer, we identified prominent authors such as Michael Berk, Roger McIntyre, and Michael Maes as central figures within highly interconnected networks. These clusters underscore strong collaborative relationships among leading researchers and their teams. For example, Michael Berk's cluster (green) demonstrated extensive collaboration with researchers such as Flavio Kapczinski and Sandra Odebrecht Vargas Nunes, reflecting their shared focus on neurobiological and therapeutic studies. Similarly, Roger McIntyre's cluster (orange) highlighted partnerships with Rodrigo Mansur and Lars Vedel Kessing, emphasizing clinical and translational aspects of bipolar disorder research. Additionally, smaller yet significant clusters emerged, such as the blue group led by Marion Leboyer, focusing on immune dysregulation, and the purple group led by Ole Andreassen, which delved into genetic associations (Fig. 2).

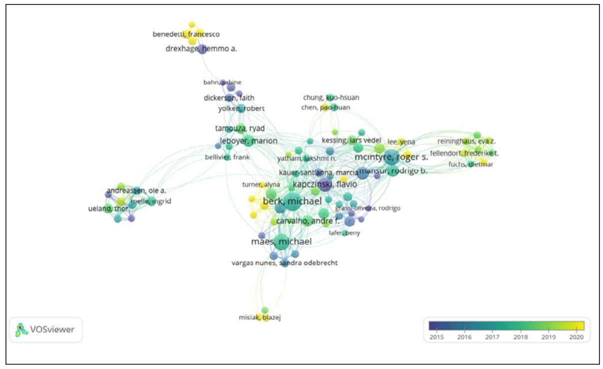

Figure 3. Temporal co-authorship network in bipolar disorder and inflammation research.

The co-authorship overlay visualization further highlights the evolving collaborative trends within the field. This map depicts clusters of active researchers, with Michael Berk (green cluster) and Roger McIntyre (yellow-green cluster) being central contributors. The color gradient from blue (earlier publications) to yellow (recent activity) illustrates the progression of research contributions over time. For instance, authors like Francesco Benedetti (yellow cluster) show increased recent activity, pointing to emerging focus areas. In contrast, Marion Leboyer and Ole Andreassen (blue-green clusters) represent foundational work that continues to shape the field through ongoing collaborations (Fig. 3).

Research Hotspots and Keyword Burst Detection

The keyword co-occurrence network offers valuable insights into the thematic structure and evolving research trends in the intersection of bipolar disorder and inflammation. Central terms such as bipolar disorder, depression, and cytokines emerged as pivotal nodes, connecting diverse research areas and highlighting their foundational role in this field. Distinct clusters reflect specific thematic focuses as follows: The green cluster emphasized inflammation and immune activation, featuring terms such as CRP, microglia, and maternal immune activation. The red cluster centered on systemic and metabolic perspectives, with keywords like cytokines, psychiatric disorders, and metabolic syndrome. The blue cluster focused on clinical and therapeutic aspects, including bipolar depression, antidepressants, and gut microbiota. The purple cluster encompassed methodologies and tools, with keywords like clinical trial and machine learning (Fig. 4).

Emerging trends were evident in terms such as COVID-19, epigenetics, and gut-brain axis, underscoring the growing interest in systemic and integrative approaches to understanding bipolar disorder. The overlay visualization revealed a temporal progression in research themes. Earlier topics, including oxidative stress and serotonin (2017–

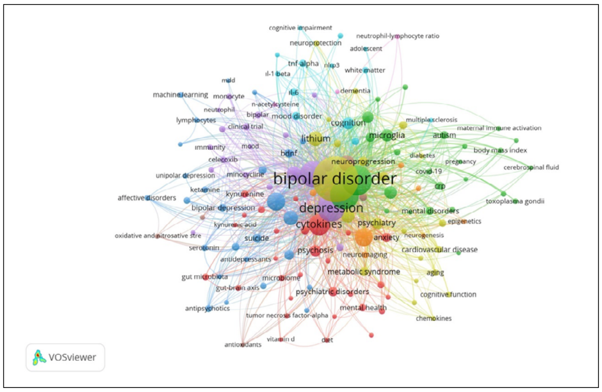

Figure 4. Keyword co-occurrence network in bipolar disorder and inflammation research.

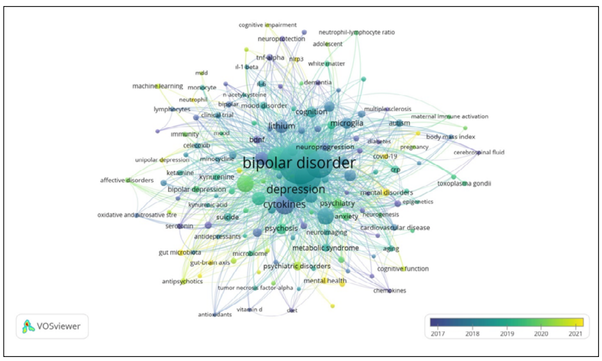

Figure 5. Temporal dynamics of keyword co-occurrence in bipolar disorder and inflammation research.

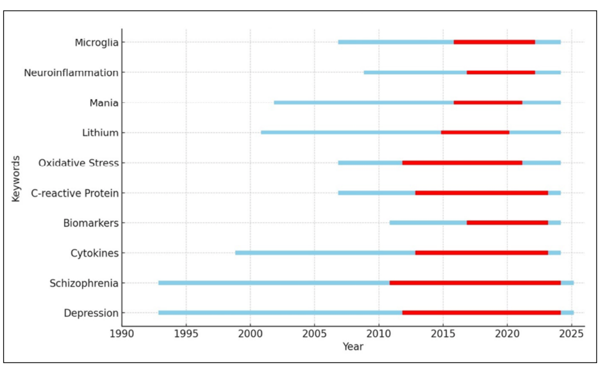

Figure 6. Keyword trends with burst periods.

2018, depicted in purple and blue), transitioned to newer themes such as neutrophil-lymphocyte ratio and maternal immune activation (2020–2021, depicted in yellow and green) (Fig. 5).

To quantitatively identify which research topics have experienced a rapid surge in scholarly attention, we performed a 'burst detection' analysis on keywords. This algorithm, integrated within VOSviewer, identifies keywords whose frequency increases sharply compared to other keywords, signaling a new or re-emerging research hotspot.

The results of this burst detection are visualized in Figure 6.

The analysis reveals significant temporal dynamics, with core terms such as "Depression", "Schizophrenia", and "Cytokines" maintaining prolonged activity since the early 1990s, as evidenced by their extensive blue spans. Notably, periods of heightened attention (indicated by red bursts) highlight the evolving focus of research, with "C-reactive Protein", "Oxidative Stress", and "Neuroinflammation" showing distinct bursts of activity from 2012 to 2023. Emerging terms like "Microglia" and "Neuroinflammation" demonstrate more recent research interest, reflecting the expanding exploration of systemic and molecular mechanisms underlying psychiatric conditions (Fig. 6).

The red lines represent the burst periods, indicating heightened attention to the respective keywords, while the blue bars denote the total time span of activity for each keyword.

DISCUSSION

This bibliometric analysis of bipolar disorder and inflammation provides a detailed overview of the research development in this field over the past several decades. The increasing number of publications, particularly in the last decade, reflects the growing recognition of inflammation as a critical component in the pathophysiology of bipolar disorder. Similar trends have been observed in bibliometric studies focusing on other psychiatric disorders, such as schizophrenia and depression, further emphasizing the importance of inflammation in mental health research.

The findings of this study align with a growing body of literature that underscores the central role of inflammation in the pathophysiology of bipolar disorder and related psychiatric conditions. Consistent with previous meta-analyses, elevated levels of key pro-inflammatory cytokines have been implicated in both acute and chronic phases of illness, highlighting their potential utility as biomarkers for diagnosis and treatment stratification.[4,18] Moreover, the association between persistent inflammation and treatment resistance, as observed in MDD, suggests that targeting inflammatory pathways may offer a promising avenue for improving therapeutic outcomes.[6]

Recent research underscores the transdiagnostic relevance of inflammatory markers, as similar patterns are observed in bipolar disorder, depression, and schizophrenia. For example, the consistent enrichment of pro-inflammatory bacteria and depletion of anti-inflammatory butyrate-producing genera in the gut microbiota of patients with psychiatric disorders suggests a systemic and integrative perspective on mental health.[19] This is further supported by evidence linking microglial activation and astrocyte dysfunction to neuroinflammatory processes, which may compromise the blood-brain barrier and exacerbate disease progression.[8] The interplay between environmental stressors and inflammation also warrants further discussion. Studies have shown that childhood maltreatment is associated with heightened inflammatory responses and structural brain changes, contributing to the severity and complexity of psychiatric presentations.[20] These findings underscore the need for preventive strategies targeting early-life adversity to mitigate long-term psychiatric and medical comorbidities.

Advances in treatment modalities, including anti-inflammatory agents and rapid-acting therapeutics targeting glutamate and GABA systems, offer hope for addressing the limitations of conventional pharmacological approaches.[21,22]

Future research should focus on integrating these approaches with psychosocial interventions to develop personalized treatment strategies that account for the heterogeneity of inflammation-related pathways in psychiatric disorders.

Growth in Publications

The number of publications on bipolar disorder and inflammation has grown exponentially, especially since 2015, reflecting a significant increase in research activity in this area. This surge coincides with a qualitative shift towards more mechanistic and integrative research approaches, with growing interest in topics like gut microbiota and neuroprogression, as well as advancements in related fields such as neuroimmunology and psychoneuroimmunology. This trend suggests a broader movement toward exploring systemic mechanisms underlying mental health conditions. The expanding body of evidence linking these inflammatory biomarkers to the clinical presentation and progression of bipolar disorder, coupled with the recognition of inflammation as a potential therapeutic target, has likely driven this increased research output.

Contributions of Countries and Institutions

The United States, Brazil, and Canada led research output on bipolar disorder and inflammation, likely due to strong academic infrastructure and high healthcare investment.[23-26] The U.S., in particular, dominated both publication volume and international collaboration, mirroring trends in related fields such as depression and schizophrenia. In contrast, regions like Africa and Southeast Asia remain underrepresented, highlighting the need for greater funding and collaborative efforts to reduce global disparities in mental health research.

At the institutional level, the University of Toronto (Canada), Deakin University, and the University of Melbourne (both Australia) were top contributors. Their output reflects specialized programs in mental health and inflammation, along with strong clinical integration. These trends are consistent with other bibliometric studies in psychiatric research.[12] Robust institutional collaboration networks across North America, Europe, and Australia underscore the importance of fostering global, interdisciplinary partnerships to advance the field.

Dominant Journals and Authors

Top-tier journals such as Journal of Affective Disorders and Brain, Behavior, and Immunity (both Q1) are primary outlets for research on bipolar disorder and inflammation, underscoring the field's relevance across psychiatry and immunology.

Michael Berk is a leading figure, with a prolific and influential publication record. Our analysis identified him as the most productive author in this field (98 publications), alongside other key contributors like Michael Maes (69 publications) and Roger McIntyre (70 publications).

To contextualize the overall scientific standing of these key contributors, we also identified their h-index as reported by the Web of Science Core Collection. Michael Berk (h-index=130), Michael Maes (h-index=122), and Roger McIntyre (h-index=104) all possess exceptionally high h-index values. This confirms their status as central, high-impact figures in the broader scientific community, reinforcing their dominance in this specific research nexus.

As the most prolific contributor identified in our analysis, Michael Berk's work in particular highlights the field's evolution. His research has notably advanced understanding of the link between immune dysfunction and bipolar disorder, with publication peaks aligning with growing interest in immunopsychiatry (e.g., 2016, 2019, 2020).[27,28] His output rose from ~3 articles per year (2010–2013) to ~9 annually (2014–2020), reflecting increasing engagement.

Despite strong individual contributions, co-authorship analysis reveals limited collaboration among top researchers. This highlights the need for interdisciplinary partnerships, international research programs, and funding strategies to promote data sharing and collective progress. Initiatives such as global workshops and consortium-based projects could enhance knowledge integration and accelerate clinical translation.

Research Hotspots and Emerging Trends

Keyword analysis highlighted "cytokines", "inflammation", and "oxidative stress" as central themes, with emerging topics such as "gut microbiota", "neuroprogression", and "epigenetics" gaining prominence in recent years. These trends reflect a growing interest in understanding the systemic and molecular mechanisms underlying the inflammatory processes in bipolar disorder. The role of the gut-brain axis has particularly captured attention, with studies demonstrating the impact of microbiota dysbiosis on systemic inflammation and mood regulation. The consistent depletion of anti-inflammatory butyrate-producing bacteria and enrichment of pro-inflammatory genera in individuals with bipolar disorder underscores the potential for microbiota-targeted interventions, such as probiotics or dietary modifications. Furthermore, the concept of neuroprogression, characterized by chronic inflammation-induced structural and functional brain changes, has emerged as a critical area of study. Microglial activation, astrocyte dysfunction, and mitochondrial impairments have been implicated in this process, suggesting that interventions targeting neuroinflammation may hold promise for halting or reversing disease progression. These emerging trends hold significant promise for the development of novel diagnostic and therapeutic strategies, including microbiota-targeted interventions, personalized medicine approaches based on individual inflammatory profiles, and interventions aimed at preventing or mitigating neuroprogression. Such advancements could lead to more effective and personalized treatments for bipolar disorder, ultimately improving patient outcomes.

Global Analysis of Publication Trends

The findings of this bibliometric analysis reveal a significant increase in research output on bipolar disorder and inflammation over the past two decades, underscoring the growing recognition of inflammation as a critical component in psychiatric disorders. The publication trajectory can be categorized into distinct phases: An early growth phase (2000–2010) with sparse publications reflecting the nascent stage of research exploring the link between inflammation and bipolar disorder.[29,30]; an acceleration phase (2011–2020) marked by increased publications, driven by advancements in immunopsychiatry, the identification of key inflammatory biomarkers (e.g., IL-6 and TNF-alpha), and the development of improved methodologies.[31,32]; and a recent surge phase (2021–2024) with continued growth and increasing focus on emerging themes like the gut-brain axis, neuroprogression, and precision medicine.[33-36]

The global distribution of research output reveals notable disparities. The United States leads, contributing 27.3% of all publications, likely due to robust funding, advanced research infrastructure, and a strong emphasis on mental health. Brazil and Canada follow as the second and third most prolific contributors, reflecting strong regional focus on psychiatric and immunological research. Other key contributors include China, Australia, and the United Kingdom. However, research output from underrepresented regions such as Africa and Southeast Asia remains limited, emphasizing the need for increased funding and international collaborations to address global disparities in mental health research.

Emerging research themes align with the increased publication volume, with growing interest in understanding the role of the gut-brain axis, epigenetics, and precision medicine in bipolar disorder. Studies exploring how microbiota dysbiosis contributes to systemic and neuroinflammation, as well as the impact of environmental factors (e.g., stress, early-life adversity) on inflammatory pathways, are driving new avenues of research. Precision medicine, particularly the use of inflammatory biomarkers for targeted therapeutic interventions, represents a promising direction.

Looking ahead, projections suggest continued expansion, with publications on bipolar disorder and inflammation expected to double by 2030. This growth will likely be driven by advancements in technology (e.g., multi-omics approaches, neuroimaging, machine learning) and increasing interdisciplinary and international collaborations. These trends underscore sustained global interest and investment in immunopsychiatry.

Beyond publication metrics, this analysis reveals the qualitative evolution of research on bipolar disorder and inflammation. Early work focused on peripheral cytokines and cross-sectional associations, but the field has shifted toward mechanistic studies exploring microglia, gut microbiota, oxidative stress, and neuroprogression. Methodologies have advanced from correlational designs to longitudinal cohorts, neuroimaging, and clinical trials of anti-inflammatory agents.

Emerging topics such as "gut microbiota", "epigenetics", and "neuroprogression" reflect a broader move toward integrative, systems-level approaches. Despite this progress, causality remains a challenge-most studies demonstrate associations, not mechanisms. Identifying inflammatory endophenotypes that predict treatment response or disease trajectory is a key research priority.

Translation from bench to bedside also lags, with few findings yet informing clinical practice. Future efforts should focus on well-designed trials of targeted therapies and personalized interventions based on inflammatory profiles. Finally, while publication counts reflect activity, they don't capture quality or impact. Integrating citation metrics and alternative indicators of influence—such as translational reach or policy impact—can offer a fuller picture of research significance.

Challenges and Future Directions

Despite significant advances, several challenges persist. A key issue is the heterogeneity of inflammatory biomarkers and their inconsistent relationship with clinical outcomes, hindering their integration into diagnostic and therapeutic frameworks. Future research should prioritize identifying robust biomarkers that reliably stratify patients and predict treatment response. Emerging technologies, such as machine learning, neuroimaging, and multi-omics approaches, offer exciting opportunities to unravel the complex interplay between immune, genetic, and environmental factors in bipolar disorder. This includes investigating the causal relationships between inflammation and BD, moving beyond observed associations. Furthermore, research should focus on translating these findings into clinically useful tools, such as diagnostic assays and personalized treatment strategies.

Implications for Clinical Practice

The findings of this bibliometric analysis have significant implications for clinical practice. Identifying inflammatory subtypes in bipolar disorder could pave the way for personalized treatment approaches, combining mood stabilizers with targeted anti-inflammatory therapies. Interventions aimed at modulating the gut microbiome or mitigating the impact of early-life stressors offer novel avenues for prevention and management. Ultimately, these research efforts aim to improve diagnostic accuracy, personalize treatment selection, and develop more effective preventative strategies for individuals with bipolar disorder.

Limitations

This study has several limitations. First, and most significantly, our reliance exclusively on the Web of Science Core Collection (WOSCC) introduces a potential selection bias. While WOSCC was chosen for its robust and clean metadata ideal for bibliometric network analysis, this decision omits publications indexed in other major databases. The omission of Scopus, which generally has broader journal coverage (including more conference proceedings and non-English journals), may mean our study underrepresents contributions from certain geographical regions or emerging research groups. The omission of specialized biomedical databases like PubMed and Embase may lead to an underestimation of clinically-focused research, such as specific clinical trials or detailed pharmacological studies that might not be indexed in WOSCC. Consequently, our findings map the research landscape as reflected in the high-impact, WOSCC-indexed literature and may not represent the entire corpus of research on this topic. Furthermore, as noted in our methods, WOSCC predominantly indexes English-language literature. While our search had no language restriction, this database-level bias likely excludes significant research published in other languages, further skewing the geographical distribution of productivity.

Second, while VOSviewer effectively maps networks and trends, it may oversimplify complex relationships among authors, keywords, and institutions. Third, reliance on citation counts may bias results toward older publications, underestimating recent impactful work. Fourth, a significant language bias is a key limitation of this study. While our search query did not include language restrictions, the WOSCC database itself is overwhelmingly English-language based. This is a substantial methodological constraint, as our analysis almost certainly excludes a large body of relevant research published in other languages. This bias directly impacts the perceived productivity and global rankings of non-Anglophone countries and research clusters. Therefore, our findings on international contributions must be interpreted with this strong caveat in mind, as they reflect the landscape of high-impact, English-language publishing rather than the totality of global research. Future analyses should use multiple databases and consider linguistic and cultural diversity. Fifth, this study does not evaluate the methodological rigor or clinical relevance of included publications, limiting practical interpretation. Sixth, while identifying top authors highlights leadership, it may overlook emerging contributors or those publishing in less visible venues. Alternative influence metrics, such as societal or translational impact, should be considered.

The Co-authorship analyses reflect network structure but not the quality of individual contributions. Balanced assessments should integrate established and emerging voices. Journals could help address linguistic disparities by offering language support and promoting open-access publishing to improve global research visibility and inclusivity.

Finally, this analysis reports the authors' general career h-index as a proxy for their overall influence, rather than a dataset-specific h-index. While this contextualizes their standing, it does not measure their specific impact within the niche field of bipolar disorder and inflammation. Future analyses could calculate the dataset-specific h-index for a more granular assessment.

Conclusion

This bibliometric analysis highlights the dynamic and rapidly evolving nature of research on bipolar disorder and inflammation. By identifying key contributors, research hotspots, and emerging trends, this study provides valuable insights into the current state and future directions of the field. Strengthening international collaborations, leveraging advanced methodologies, translating these findings into clinical practice, and engaging patients in research design and dissemination will be critical for addressing the unmet needs of individuals with bipolar disorder and advancing mental health research globally.

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Informed Consent

Not applicable. This study did not involve human participants or patient data.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: I.O.U., T.D.B.; Design: I.O.U., T.D.B.; Supervision: I.O.U., T.D.B; Fundings: I.O.U., T.D.B.; Materials: I.O.U., T.D.B.; Data collection &/or processing: I.O.U., T.D.B.; Analysis and/or interpretation: I.O.U., T.D.B.; Literature search: I.O.U., T.D.B.; Writing: I.O.U., T.D.B.; Critical review: I.O.U., T.D.B.

Conflict of Interest

There is no conflict of interest to declare.

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Bibliyometrik Analiz: Bipolar Bozuklukta İnflamasyon Konulu Küresel Araştırma Alanının Haritalandırılması

Bipolar bozukluk (BB), mani, hipomani ve depresyon ataklarıyla seyreden kronik bir psikiyatrik hastalıktır. Son yıllarda artan kanıtlar, inflamasyonun BB'nin patofizyolojisinde kritik bir rol oynadığını, özellikle pro-inflamatuar sitokin düzeylerinde artış ve sistemik bağışıklık disfonksiyonunun hastalıkla ilişkili olduğunu göstermektedir. Ancak, bipolar bozukluk ve inflamasyon konusunu odak noktasına alan kapsamlı bir bibliyometrik analiz bulunmamaktadır. Bu çalışma kapsamında, 2024 yılına kadar olan dönemi kapsayacak şekilde Web of Science Core Collection (WOSCC) veri tabanı kullanılarak bibliyometrik bir analiz gerçekleştirilmiştir. VOSviewer yazılımı ile yayın dinamikleri, etkili yazarlar, atıf örüntüleri, anahtar kelime eş-oluşumları ve ortak yazarlık ağları analiz edilmiştir. Toplamda 1.812'si özgün makale ve 718'i derleme olmak üzere 2.530 yayın tespit edilmiş ve 2015 yılından itibaren belirgin bir artış gözlemlenmiştir. Amerika Birleşik Devletleri, Brezilya ve Kanada en çok yayın yapan ülkeler olarak öne çıkarken, Toronto Üniversitesi ve Deakin Üniversitesi gibi kurumlar önemli katkılarda bulunmuştur. Etkili yazarlar arasında Michael Berk, Roger McIntyre ve Michael Maes dikkat çekmektedir. Araştırmaların odaklandığı anahtar kelimeler arasında "sitokinler","nöroenflamasyon" ve "oksidatif stres" yer alırken, "bağırsak mikrobiyotası" ve "nöroprogresyon" gibi yeni kavramlar, araştırma eğilimlerinin evrildiğini göstermektedir. Ani atıf artışı analizi, inflamatuvar biyobelirteçler ve yeni tedavi yaklaşımlarındaki önemli gelişmeleri ortaya koymuştur. Bununla birlikte, özellikle az temsil edilen bölgelerde, küresel iş birliği ağlarının sınırlı olduğu görülmektedir. Bu bibliyometrik analiz, inflamasyonun BB'deki rolüne artan ilgiyi ortaya koymakta ve başlıca katkı sağlayıcıları, araştırma eğilimlerini ve gelecekteki yönelimleri tanımlamaktadır. Gelecek çalışmaların uluslararası iş birliklerine, sistemik ve moleküler mekanizmalara ve tanı ve tedaviyi iyileştirmeye yönelik translasyonel çalışmalara öncelik vermesi önerilmektedir. Bu bulgular, bipolar bozukluk ve inflamasyon araştırmalarını ilerletmek için bir yol haritası sunmaktadır.

Anahtar Sözcükler: Bibliyometrik analiz; bipolar bozukluk; inflamasyon; nöroenflamasyon; sitokinler.