

An Examination of Publication Trends in Borderline Personality: A Bibliometric Analysis

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Abstract. In recent years, borderline personality disorder (BPD) is recognized as a severe mental health issue, generating significant research interest. Despite this recognition, a comprehensive analysis of trends and publications within the field has not been conducted. To address the gap, this research performed a bibliometric analysis to identify trends and contributed to publications on BPD. The Scopus database served as the reference, analyzing 672 files spanning from 2018 to 2021 through VOSviewer. As a result, the Journal of Personality Disorder became the leading publisher of BPD-related articles, followed by the Journal of Personality Disorder: Theory, Research, and Treatment in second place, with the Journal of Affective Disorder securing third position. The United States became the country with the highest number of publications. However, it was crucial to acknowledge the limitations of the research, particularly the restriction of the search to a single database, potentially leading to the exclusion of relevant articles described elsewhere. After analyzing the keywords through the co-occurrence map, seven distinct cluster groups in the scientific landscape associated with BPD were identified.

Keywords: bibliometric, borderline personality disorder, publication trend, VOSviewer

Pengujian Tren Publikasi pada Kepribadian Ambang: Analisis Bibliometrik

Abstrak. Dalam beberapa tahun terakhir, gangguan kepribadian ambang (*borderline personality disorder/BPD*) diakui sebagai masalah kesehatan mental yang parah, sehingga menimbulkan minat penelitian yang signifikan. Meskipun ada pengakuan ini, analisis komprehensif mengenai tren dan publikasi dalam bidang ini belum dilakukan. Untuk mengatasi kesenjangan tersebut, penelitian ini melakukan analisis bibliometrik untuk mengidentifikasi tren dan berkontribusi pada publikasi tentang BPD. Basis data Scopus menjadi referensi, menganalisis 672 file mulai tahun 2018 hingga 2021 melalui VOSviewer. Hasilnya, Journal of Personality Disorder menjadi penerbit terkemuka artikel terkait BPD, disusul Journal of Personality Disorder: Theory, Research, and Treatment di posisi kedua, dan Journal of Affective Disorder di posisi ketiga. Amerika Serikat menjadi negara dengan jumlah publikasi terbanyak. Namun, penting untuk mengakui keterbatasan penelitian, khususnya pembatasan pencarian pada satu database, yang berpotensi menyebabkan pengecualian artikel relevan yang dijelaskan di tempat lain. Setelah menganalisis kata kunci melalui peta kejadian bersama, tujuh kelompok kluster berbeda dalam lanskap ilmiah yang terkait dengan BPD diidentifikasi.

Kata Kunci: bibliometrik, gangguan kepribadian ambang, tren publikasi, VOSviewer

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The term borderline was initially introduced by Stern (1938) to describe patients positioned between neurotic and psychotic groups, showcasing resistance to psychotherapy. Subsequently, Spitzer (1979) established diagnostic criteria for borderline personality disorder (BPD), characterized by unclear identity, self-esteem issues, negative emotions, and uncontrollable impulses. The Diagnostic Manual of Mental Disorder V (American Psychiatric Association, DSM-5 Task Force, 2013) later expanded BPD criteria to include fear of rejection, interpersonal problems, chronic suicidal behavior, chronic feelings of meaninglessness, anger outbursts, and low self-esteem. The prevalence rate of BPD is estimated at 1.6%, with recorded rates of 6% to 10% in clinical populations, and 20% in clinical patient populations (American Psychiatric Association, DSM-5 Task Force, 2013). Recent data suggests a worldwide prevalence of BPD ranging from 0.7% to 2.7%, associating with functional impairment and increased use of healthcare resources (Bohus et al, 2021; Leichsenring et al, 2023). Therefore, BPD is a mental health concern demanding attention and effective management (Burghardt et al, 2023; Cao et al, 2023; Heekerens, Schulze, et al, 2023; Shen et al, 2023; Woodbridge et al, 2023). Investigations must be conducted comprehensively to fully understand and address the concern (Aleva et al, 2023; Culina et al, 2023; Guillén et al, 2023; Heekerens, Gross, et al, 2023; Moore, 2023; Peters et al, 2023). A crucial aspect for analysts

to comprehend is the publication trends in BPD (Alandete et al, 2023; Calado et al, 2023; Yuan et al, 2023; Zanarini et al, 2023).

BPD is a severe mental disorder characterized by heightened patterns of impulsive behavior, problematic interpersonal relationships, low self-esteem, and a dominant-negative effect (American Psychiatric Association, DSM-5 Task Force, 2013; Botsford & Renneberg, 2020; Michael et al, 2021). Additionally, it is associated with elevated rates of comorbidity with other psychiatric conditions, resulting in lost productivity and imposing high economic costs due to intensive treatment (Michael et al, 2021; Miller et al, 2021). Individuals with BPD frequently contend with a range of negative mood conditions, including jealousy, shame, feelings of neglect, emptiness, loneliness, guilt, betrayal, dislike, hostility, and anger (Bourke et al, 2021; Cremers et al, 2021; Crowell et al, 2009; Michael et al, 2021; Reisch et al, 2008; Stiglmayr et al, 2005; Wongpakaran et al, 2021). These individuals often endure high emotional stress and are hypersensitive (Miller et al, 2021). Challenges also arise in recognizing emotional changes, understanding them, and appropriately expressing emotions based on a specific context (Conklin et al, 2006; Bornstein et al, 2010). Emotional reactions tend to be excessive and impulsive, accompanied by elevated irritability levels. Moreover, BPD patients frequently have feelings of emptiness (Klonsky, 2008), engage in bingeing and purging behaviors (Selby et al, 2012), and experience rumination (Gallardo-Pujol & Pereda,

2013; Martino et al, 2015). Typically appearing during adolescence or early adulthood, BDP induces functional impairment and subjective discomfort (American Psychiatric Association, DSM-5 Task Force, 2013).

This research uses a bibliometric analysis because it serves as a valuable method for discerning, classifying, and categorizing components within articles, including keywords, index terms, authors, co-authors, and citations (Barragán Martín et al, 2021; De Bellis, 2009). The method offers insights into the most prolific authors, countries, institutions, and journals within a specific context. Additionally, a bibliometric analysis aids in examining trends in publication output, collaborative networks among analysts, and the broader scientific publication landscape through visual representations (Diniæ & Jevremov, 2021; Pan et al, 2018).

The method also identifies, classifies, and categorizes elements in articles such as keywords, index keywords, authors, co-authors, and citations. A bibliometric provides information about the most prolific authors, countries, institutions, and journals on a particular topic (De Bellis, 2009). Furthermore, the method analyzes trends in publication production and collaboration networks between analysts (De Bellis, 2009; Nuryana et al, 2021). Bibliometric also generates insights that describe publication in a structured manner through product visualization (Diniæ & Jevremov, 2021; Pan et al, 2018).

Bibliometric analysis includes the description of scientific productivity, research trends, visual representations of specific scientific investigations, future research directions, main research directions, and research development (Zyoud et al, 2018). Additionally, the method enhances communication among analysts, facilitates the sharing of knowledge discoveries, aids in information retrieval, and provides essential input for scientific policy, research management, and ideas for future investigations (Nuryana et al, 2021; Pan et al, 2018).

Several significant aspects arise from this analysis, firstly, the analysts used articles from the Scopus database, known for providing more comprehensive records, particularly in the social sciences, compared to the Web of Science (WoS) (Harzing & Alakangas, 2016). The Scopus database ensures more accurate data selections, better control over referenced documents, and greater reliability in indexing data than Google Scholar (Cecchino, 2010).

Secondly, the analysis focused solely on original articles sourced from journals, and the decision is grounded in two primary reasons. The first reason is that journal-published articles offer the latest empirical results and up-to-date knowledge related to the analyzed themes, thereby ensuring this research shows the most current and reliable trends. The second reason is that articles provide a comprehensive list of references for further citation data analysis. Thirdly, articles present the latest trends in

particular research themes, offering a more detailed description of science development.

Alongside the keyword analysis map, a bibliometric analysis of BPD will generate two additional maps. The first covers a bibliographic coupling map, representing the relationship between authors based on the references they cite. The map explains diverse research groups and directions within the overarching concept of BPD. The second map is the authors co-citation map, serving as a representation of basic knowledge applicable to the ongoing investigation.

This research aimed to investigate the predominant themes that have surfaced in the publication BPD to date and propose directions for future investigations. To achieve such an objective, it addresses the following inquiries: (1) What is the current state of research dedicated to BPD? (2) What are the primary thematic domains in BPD research over the past four years? (3) What is the intellectual framework showing BPD in academic literature? (4) What are the principal discoveries derived from BPD research? (5) What potential gaps in future research can be discerned in BPD?

To the best of the analysts knowledge, no bibliographical analysis of BPD has been conducted in any journal databases globally. Therefore, this research aimed to analyze the trend and evolution of such a topic, providing an overview of the articles related to BPD over the last four years. The analysis covers indicators such as keywords, citation numbers,

publications, document types, countries, institutions, and authors productivity. Given the dynamic development of the topic, the investigation aimed to offer enhanced insight into BPD using a bibliometric analysis. Based on the analysis, critical topics and domains can be mapped, exploring key issues related to BPD research and outlining development in the research theme. Two types of descriptors, including author keywords and indexed keywords, were used in the analysis. This approach allows the results to provide dual perspectives on BPD themes, unveiling the main directions of BPD research and suggesting new avenues within the research domain. An additional objective of the analysis is to investigate trends and disciplines related to BPD, represented by author coupling based on the similarity of reference files and a network of author co-citations. Differences between research groups can offer further insight into the main directions of BPD research and help explore possible cohesion or differences.

Method

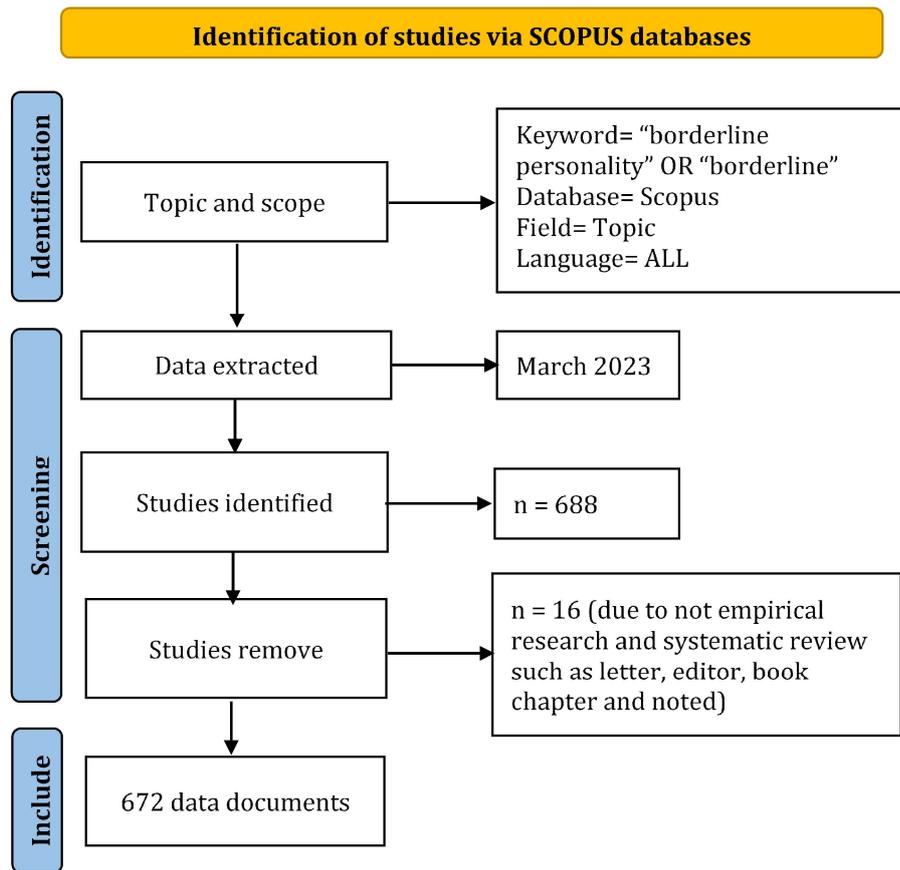
Data collection and search strategy

A total of 672 *original* files were collected from the Scopus database using the term “borderline personality” OR “borderline”. These articles were specifically filtered to include only publications from the last four years, spanning from 2018 to 2021. The rationale behind the selection criteria was to discern the then-current focus of articles on borderline personality, using

the latest update and results. Additionally, stringent data filters were applied to include only articles within the field of psychology, emphasizing empirical analysis published in journals,

categorized as final articles, (excluding in-press articles), and composed in English. Figure 1 presented the sequential flow of a bibliometric process and selection.

Figure 1
The Flow Chart of The Search Process



Inclusion and exclusion criteria

The inclusion criteria were (1) articles that exclusively focused on BPD, (2) published between 2018 and 2021, (3) within the field of psychology, (4) empirical research files (5) references from journals, and (6) articles written in English. Conversely, the exclusion criteria comprised (1) systematic literature reviews, (2) in-press articles, (3) unpublished articles from journals, and (4) gray literature.

Data analysis

For data analysis, files were downloaded from the Scopus database as CVS files. Subsequently, the data were analyzed using VOSviewer v. 1.6.17 (van Eck & Waltman, 2021) for co-authorship, keywords co-occurrence, citation, and bibliographic coupling. This analysis provided a visualization network and overlays that explained the trends of publications related to borderline

personality. To investigate the subject area of BPD, a bibliographic mapping method was applied. Theme research was visually represented by a co-occurrence term map based on the articles co-occurrence descriptor. In the co-occurrence maps, descriptors frequently appearing together in articles were placed close on the map, showing the common research topic. Two network map terms were computed, based on the type of descriptors used.

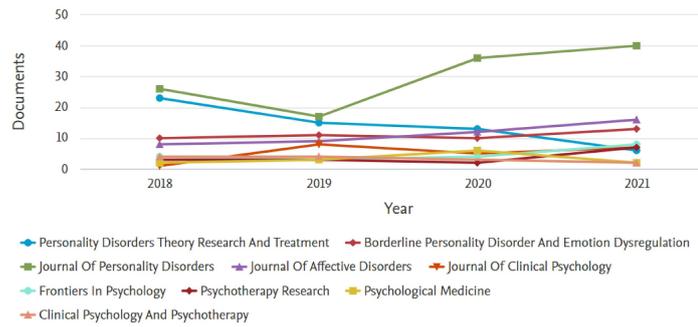
In one instance, author keywords were adopted, while indexed keywords were used in the other. Regarding author keywords, the frequently used term “borderline personality”, present in all articles, was omitted to achieve a clearer picture of the term cluster. The same strategy was applied in the case of indexed keywords to facilitate result comparison. Research trends and disciplines were represented by a network of maps showing the relationship between authors. Firstly, a bibliographic coupling of the authors map was computed. The map showed the connections between authors based on the similarity of cited files, showcasing affiliations or prior knowledge similarities. Authors citing the same document were positioned close to each other on the map. Secondly, maps based on the co-citation analysis of authors were generated and calculated. The map visualized the relationship between cited authors based on coincidence in the references. Authors frequently cited together were positioned in

proximity on the map, unveiling diverse directions in established knowledge represented by these authors. Bibliographic units were represented by circles, and lines showed stronger relationships between the units. The circle size corresponded to the number of articles associated with a particular term or authors, except in the case of a co-citation map, where the size was proportional to the number of citations. The circle color represented cluster membership on the network map. Lastly, the term map was presented in an overlay version (Leydesdorff & Rafols, 2012), where the circles color signified the average year of publications.

Results

A total of 672 files on BPD were identified in the Scopus database and analyzed using the indicators, comprising the type of research conducted and trends in the subject. The Journal of Personality Disorder published the highest number of articles on BPD (119), followed by The Journal of Personality Disorder: Theory, Research, and Treatment (57), Journal of Affective Disorder (45), BPD and Emotion Dysregulation (44), Journal of Clinical Psychology (21), Frontier in Psychology (19), Psychotherapy Research (15), Psychological Medicine (13), Clinical Psychology and Psychotherapy (10), and Comprehensive Psychiatric (10). Refer to Figure 2 and Table 1 below.

Figure 2
Selection of Journals on Borderline Personality



The mentioned journals were part of the first and second quartiles of the SCImago Journal and Country Rank (SJR). These quartiles in SJR suggested that the journals were

considered significant and of high quality in the field. The majority of the files were published in journals from the United States, United Kingdom, Germany, and the Netherlands.

Table 1

Selection of Journals with The Most Publication on Borderline Personality (2021-2018)

Sources	Documents	Citation	Total Link Strength	Quartile	SJR (2021)	H Index	Country
<i>Journal of Personality Disorders</i>	119	557	85	Q1	1.02	99	United States
<i>Personality Disorders: Theory, Research, and Treatment</i>	57	427	53	Q1	1.48	54	United States
<i>Journal of Affective Disorders</i>	45	146	38	Q1	1.79	205	Netherlands
<i>Borderline Personality Disorders, and Emotion Dysregulation</i>	44	250	22	Q1	1.24	21	United Kingdom
<i>Frontier in Psychology</i>	19	69	19	Q1	.87	133	Switzerland
<i>Psychotherapy Research</i>	15	92	18	Q1	1.38	80	United States
<i>Psychological Medicine</i>	13	102	9	Q1	2.33	220	United Kingdom
<i>Clinical Psychology and Psychotherapy</i>	10	39	8	Q1	1.1	81	United Kingdom
<i>Journal of Clinical Psychology</i>	21	38	8	Q1	1.16	127	United States
<i>Comprehensive Psychiatric</i>	10	91	6	Q1	1.57	112	United Kingdom

Note. A minimum of 10 documents are shown in the table above.

Figure 3

Trend Publication on Borderline Personality by Country

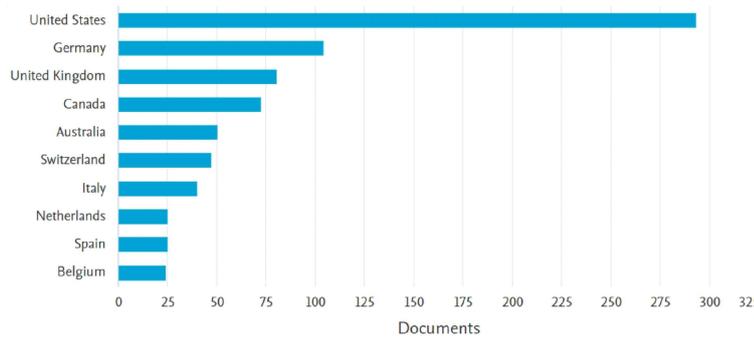


Figure 3 presented the distribution of documents by country from 2018 to 2021. The United States of America led with the highest number of publications (291), followed by Germany (104), the United Kingdom (80), Canada (69), Australia (50), Switzerland (47), Italy (40), Netherlands (25), Spain (25), and Belgia (24). Among these, Germany held the second-highest number of publications on BPD, followed by the United Kingdom.

Using author bibliographical analysis to uncover distinct author groups and their

respective focus fields in BPD research (Table 2), several groups surfaced. The largest group, contributing to over 40% of publications, was centered around Sharp, C. The second-largest group focused on Hepertz, S.C., while the third-largest group was associated with Fitzpatrick, S. Following these, the fourth group was centered around Kramer, U., the fifth group centered around Chanen, A.M., and the sixth and final group centered around Temes, C.M., as shown in Figure 4 and Table 2.

Figure 4

Selection of Authors with The Most Publications on Borderline Personality

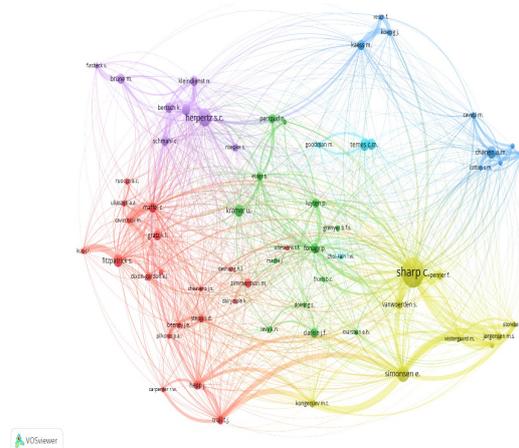


Table 2

Selection of Authors with The Most Publications on Borderline Personality (Bibliographic Coupling Author Analysis)

Authors	Documents	Co-citation	Total Link Strength
Sharp, C.	26	114	54
Herpertz, S.C.	15	77	20
Simonsen, E.	14	65	92
Chanen, A.M.	11	69	36
Kramer, U.	11	68	11
Temes, C.M.	11	22	6
Fitzpatrick, S.	11	41	12
Bohus, M.	10	53	15
Zanarini, M.C.	10	96	6
Bertsch, K.	9	36	11
Brüne, M.	9	51	11
Clarkin, J.F.	9	42	12
Fonagy, P.	9	102	13
Gratz, K.L.	9	29	3
Kaess, M.	9	43	18
Kleindienst, N.	9	42	17
Maffei, C.	9	18	5
Schmahl, C.	9	58	20
Hepp, J.	8	24	23
Luyten, P.	8	127	18
Perroud, N.	8	78	18
Trull, T.J.	8	24	34
Vanwoerden, S.	8	41	18
Zimmerman, M.	8	37	8

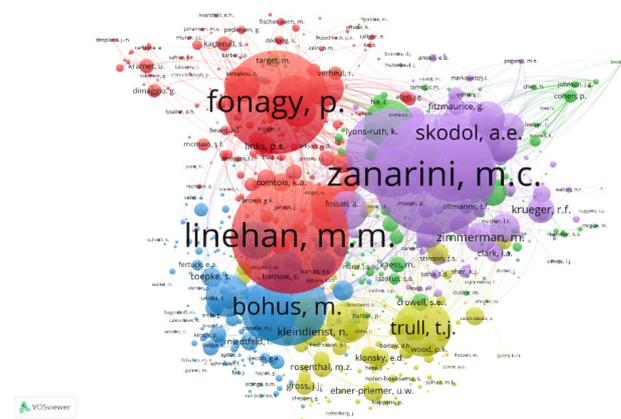
Note. A minimum of 8 documents are shown in the table above.

In contrast to the authors bibliographic domain, dominated by a single author (Sharp, C.), the reference domains of cited authors showed a more balanced result (Figure 5). The most frequently cited author on this list was

Zanarini, M.C. (959 citations), followed by Linehan, M. M. (916 citations), Fonagy, P. (824), Gunderson, J.G. (704), Frankenburg, F.R. (608), Bohus, M. (616), Skodol, A. E. (509), and Trull, T. J. (449).

Figure 5

Selection of The Most Cited Author in Borderline Personality Research

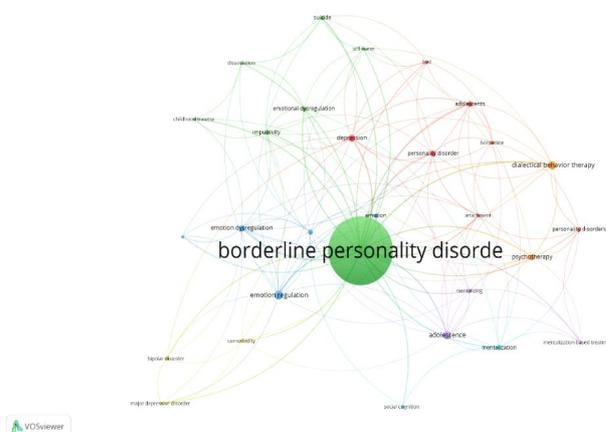


The scientific landscape of the primary research areas in borderline personality, based on the author keywords in the co-occurrence map, was visualized in Figure 6. Seven main groups were identified in this network: (1). Personality disorders, including themes in personality, adolescence, depression, and attachment traits, (2). Borderline personalities, covering childhood trauma, dissociation,

emotional dysregulation, impulsivity, self-harm, and suicide, (3). Emotion regulation, comprising momentary ecological assessments, (4). Bipolar disorder, including major depressive disorder and comorbidities, (5). Mentalization and youth-based care, (6). Social cognition and mentalization, and (7). Dialectical behavior therapy and psychotherapy.

Figure 6

Map of Co-occurrence of Author Keywords



Keyword analysis showed 19 important keyword themes trending in borderline personality research. Identifying the keyword trends was crucial for showing researched areas and shedding light on themes that required further exploration. The

results provided recommendations for future analysis, particularly in understanding the relationship of such themes and variables with BPD. Table 3 presented the 19 keyword themes trends as a reference for further investigation.

Table 3*Summary of Theme Trends Found through Keyword Analysis*

No	Trend and themes
1	Borderline personality disorder
2	Personality disorder
3	Emotion
4	Emotion regulation
5	Emotion dysregulation
6	Depression
7	Mayor depression
8	Bipolar depression
9	Suicide
10	Self-harm
11	Dissociation
12	Impulsivity
13	Attachment
14	Childhood trauma
15	Social cognition
16	Mentalization
17	Mentalization based treatment
18	Dialectical behaviour therapy
19	Adolescents

Discussion

This research aimed to analyze the trend and evolution of such a topic, providing an overview of the articles related to BPD over the last four years. Since Stern (1938) initially conceptualized the term borderline personality disorder (BPD) in 1938, research on the topic significantly expanded, contributing to a more comprehensive understanding of its characteristics (Durpoix et al, 2023; Hayes et al., 2023; Kanj et al., 2023; Látalová et al., 2023; Liakopoulou et al., 2023). BPD not only negatively impacted individuals and their surroundings but was also acknowledged as a serious mental disorder warranting optimal treatment (American Psychiatric Association, DSM-5 Task Force, 2013; Botsford & Renneberg, 2020; Michael et al., 2021). Furthermore, the detrimental effects of BPD, including the loss of

productivity, the high economic cost of intensive treatments, and the elevated comorbidity levels, underscored the urgent need for a comprehensive analysis of BPD (Michael et al, 2021; Miller et al, 2021).

A total of 672 files related to the publications on BPD were retrieved from the Scopus database. The Journal of Personality Disorder, managed by the International Society for the Study of Personality Disorder, became the leading publisher of articles on BPD, with 119 publications. First published in 1987, the journal reached an impressive impact factor of 3132 and a 5-year journal impact factor of 3767 (2019) based on Journal Citation Reports 2020 (Clarivate, 2020). It held the status of a Q1 journal in the Scopus Database and served as a crucial reference for analysts seeking the latest developments in personality

disorder. Following closely in the publication of BPD publications was *Personality Disorders: Theory, Research, and Treatment*, with 57 articles.

The United States (291) had the highest number of publications on BPD, surpassing Germany and the United Kingdom. Over decades, the United States evolved into a hub for psychology development, acting as a global mecca and influencing the field trajectory through the APA (Sokal, 2006; Webster et al., 2009). This dominance was inherent due to the prolific output of high-quality research by United States scholars, supported by substantial research funding (UNESCO Institute for Statistics, 2022).

Conducting an author bibliography coupling analysis identified six distinct author groups, each representing unique research directions. The Sharp, C group became the dominant force, contributing more than 40% of publications. This group was followed by the Herpertz, S.C. group, Fitzpatrick, S., Kramer, U., Chanen, A.M., and Temes, C.M.

In contrast to the author bibliographic coupling domain, which identified a single dominant author (Sharp, C.), the reference domains of cited authors showed more balanced results (Figure 4). Zannarini, M.C. (959 citations) claimed the top spot as the most cited author, followed by Linehan, M. M. (916 citations), Fonagy, P. (824), Gunderson, J.G. (704), Frankenburg, F. R. (608), Bohus, M. (616), Skodol, A. E. (509), and Trull, T. J. (449).

Analyzing the scientific landscape related to borderline personality through authors keywords in the co-occurrence map unveiled seven cluster groups. The first cluster group described the personality disorder research, including personality traits, adolescents, depression, and attachment. It explored BPD in adolescents, associated attachment types, and comorbidity with depression. The second cluster focused on examining BPD in connection with childhood trauma, the presence of dissociative disorders, emotional dysregulation, impulsivity, self-harm, and suicide.

The third cluster group explored emotional regulation, a facet of emotional intelligence including momentary ecological judgment. Authors within such cluster examined the role of emotional regulation factors in preventing the development of BPD. In the fourth cluster group, the focus was on whether major depressive disorder and bipolar disorder were the main comorbidities of BPD. Moving to the fifth cluster, attention was directed toward mentalization-based interventions and the role of social cognition in individuals with BPD. Simultaneously, the sixth cluster examined cognition and the impact of social mentalization on individuals with BPD. Finally, the seventh cluster group investigated whether dialectical behavior therapy and more specific psychotherapy affected the treatment of BPD (Table 3). All seven cluster groups were identified as research trends through a bibliometric analysis. Therefore, future

investigations could use this information to explore other hypothesized variables correlated with BPD.

This research had limitations, it exclusively considered articles related to BPD research from one database, particularly Scopus. Due to such limitation, there was a possibility that other articles related to BPD were not recorded in the search and consequently omitted from the bibliometric analysis. Therefore, it was recommended for future investigations to expand the search terms and databases. It was also recommended to conduct a systematic review and meta-analysis regarding research content and variables related to BPD, with a particular emphasis on exploring psychological interventions. Establishing a point of reference for articles in this area could serve as a foundation for future investigations. The significance of the results relied on providing further insight into understanding critical research themes in the publications related to BPD and uncovering topics, themes, and issues that had not been thoroughly analyzed, forming the basis for future investigations.

Conclusions

This research performed a bibliometric analysis to identify trends and contributed to publications on BPD. In conclusion, despite the limitation of this research, the obtained results held significant implications for understanding the development, etiology, characteristics, and contributing factors of BPD. A bibliometric

analysis facilitated the communication of key results to analysts, forming the basis for designing necessary prevention mechanisms and intervention plans. Generally, the analysis showed that the countries with the highest number of publications were the United States of America (291), followed by Germany (104), the United Kingdom (80), Canada (69), Australia (50), Switzerland (47), Italy (40), Netherlands (25), Spain (25), and Belgium (24). Among all the countries, Germany ranked second in BPD publications, followed by the United Kingdom. However, a bibliometric analysis did not uncover research on BPD in Indonesia, indicating the need for future investigations in cultural and contextual settings.

Suggestion

Previous reviews showed that BPD had evolved into a serious public health concern, with publications related to the topic witnessing an increase rather than a decrease. Therefore the analysis result carried practical implications for mental health and psychological interventions, particularly in identifying areas for future investigations and intervention design. Nineteen keyword themes, identified through keyword analysis, provided valuable insights into areas warranting further investigations and those remained less explored. Additionally, recognizing the concentration of most research could shed light on less-explored areas. This reference served future authors, thereby contributing to the development of science.

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