

Psychodermatology: A Multidisciplinary Scientometric Study of Collaborated Literature of Dermatology and Psychiatry

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ABSTRACT

Aim: This study aimed to provide insight into the evolution of research on psychodermatology using bibliometric network analysis.

Materials and Methods: We analyzed all documents in psychodermatology literature indexed between 1981 and 2020 by using a search string including the following keywords: "psychodermatology", "psychiatry and dermatology", "dermatopsychiatry" or "dermatopathology" in the Web of Science (WoS) Core Collection database.

Results: Our literature search on WoS databases revealed a total of 498 documents, 99 of which were open-access. When evaluated in terms of sheer volume, most of the studies in this field were authored by researchers based in the United States of America, with 118 documents (23.7%). The most productive source title in this field was the British Journal of Dermatology. Among authors, Bewley A. from Bart's Health NHS Trust (United Kingdom) was the most prolific author with 68 articles. The most cited article in psychodermatology literature was a review titled "Psychodermatology: An Update" by Gupta and Gupta.

Conclusions: It is possible to say that the interest in the field of psychodermatology appears to be low, especially since a single researcher has authored over 10% of the WoS articles in this field.

Keywords: Psychodermatology, psychiatry, dermatology, scientometric, bibliometric
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INTRODUCTION

Psychodermatology, also known as psychocutaneous medicine, is a collaborative subspecialty of psychiatry and dermatology investigating interactions between the brain and the skin. Despite appearing anything but similar on the surface, the brain and skin share close embryonic origins and the skin can reflect various signs of mental state, wellbeing or diseases¹.

Scientometrics is termed "the science of science" because it derives data from the progress of a scientific field and establishes its evolution and current status concerning contributions. It has become one of the most in-demand study fields and procures data on publication patterns and trends in a certain academic field². Scientometric publications reveal a holistic assessment of the productivity

of authors, countries or institutions concerning the creation of academic documents published in recognized journals. To the best of our knowledge, medicine lacks a scientometric evaluation of psychodermatology literature. Our study aims to perform a holistic analysis of psychodermatology literature as the first scientometric analysis in this area.

METHODS

We analyzed all documents in psychodermatology literature indexed between 1981 and 2020 by using a search string with relevant keywords, "psychodermatology", "psychiatry and dermatology", "dermatopsychiatry" or

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"dermatopathology" in the Web of Science (WoS) Core Collection database. The WoS database was chosen for this scientometric study, since it has been reported in the literature as being the most reliable source for this purpose, particularly due to its longevity and intra-database consistency³. We created an info map showing countries producing psychodermatology publications on a free-of-charge web source, Paintmaps⁴. Scientometric network figures were generated by running another freeware tool, named VOSviewer version 1.6.11 (Centre for Science and Technology Studies, Leiden University, The Netherlands)⁵. As this study used publicly available data obtained from open-access sources, ethical approval was not necessary.

RESULTS

General Features of the psychodermatology literature

Our literature search on WoS databases revealed a total of 498 documents, 99 of which were open-access. The most common document types in order of frequency were original article, meeting abstract and review (54.2%, 23.7% and 12.5%, respectively; Table 1). The most frequently reported fields of research were Dermatology, Psychodermatology, and Psychology (78.3%, 10.8% and 8.6%, respectively; Table 1). The English language was used in 91.96% of all psychodermatology literature, followed from afar by the German, Turkish and French languages (3.6%, 1.6% and 0.8%, respectively). Wiley, Elsevier and Springer were the most active publishers in psychodermatology (37.9%, 9.4% and 6.6%, respectively).

The first indexed document in psychodermatology literature was written by Vanmoffaert M. (Ghent University, Belgium) with the title of "Training Future Dermatologists in Psychodermatology", and the article was published in 1986. Interestingly, after this initial paper, there were no WoS-indexed papers concerning psychodermatology literature in the years 1987, 1988, 1990, 1991, 1993, 1994 and 1995 (Fig 1). The peak year in production was found to be 2020, with 63 documents.

Productivities of countries, source titles, authors, and institutions

The United States of America (USA) was noted as the country from which researchers provided the most contribution to this field, with 118 documents (23.6%) followed by the United Kingdom (UK), Germany, Poland,

and Turkey (9.4%, 6.6%, 6.4% and 5.6%, respectively; Fig 2). Articles appear to have been produced throughout the world except for most countries of Africa (Fig 3). The most productive source titles in this field were the British Journal of Dermatology, Acta Dermato-Venereologica, Dermatologic Therapy, Practical Psychodermatology, and Health Medicine and Human Development (86, 52, 33, 30, and 25 items, respectively; Table 1). Bewley A. (Bart's Health NHS Trust, UK) was the most prolific author with 68 articles, representing 13.7% of total publications in the psychodermatology field. The top ten most productive authors were from developed countries and half of the ten most contributive institutions were from the UK (Table 1).

Citation analysis

The calculated H-index of psychodermatology literature between 1986 and 2021 was noted as 29 and the total number of citations was 3143 (2541 without self-citations). Average citations per document were found to be 6.31. With 516 citations, 2020 was the year with the highest annual citation count. The most cited article of psychodermatology literature was a review titled "Psychodermatology: An update" by Gupta, MA and Gupta, AK, published in 1996 in the Journal of The American Academy of Dermatology with a total of 164 citations (Table 2).

Scientometric network analyses

The most used keywords in psychodermatology literature were "psychodermatology", "psoriasis", "depression", "quality of life" and "dermatology" (Table 3). Scientometric network analyses with VOSviewer version 1.6.11 showed a starburst pattern with a centred keyword of "psychodermatology" (Fig 4). The USA, Italy, Germany, Belgium, and the UK were detected as the most cooperative countries (Fig 5). The top five collaborative institutions were noted as Bart's Health NHS Trust (UK), National University of Asuncion (Paraguay), University of São Paulo (Brazil), University of Zaragoza (Spain) and Wroclaw Medical University (Poland) (Fig 6).

DISCUSSION

The skin and nervous system develop side by side in fetal life and remain connected throughout a person's life. The nervous system is in connection with all organs in the body. Considering that the skin is the largest organ of the body, the importance of the connection between these two systems

Table 1: Top ten document types, research areas, source titles, authors and institutions in psychodermatology literature between 1986 and 2021^a

	Number	% ^a
Document Type		
Original Article	270	54.217
Meeting Abstract	118	23.695
Review	62	12.450
Book Chapter	56	11.245
Editorial Material	24	4.819
Letter	15	3.012
Proceedings Paper	6	1.205
Book Review	3	0.602
Book	2	0.402
News Item	1	0.201
Research Area		
Dermatology	390	78.313
Psychiatry	54	10.843
Psychology	43	8.635
Pediatrics	27	5.422
General Medicine	15	3.012
Allergy	11	2.209
Pharmacology	6	1.205
Surgery	6	1.205
Neurology	5	1.004
Occupational Health	4	0.803
Journal Name		
British Journal of Dermatology	86	17.269
Acta Dermato-Venereologica	52	10.442
Dermatologic Therapy	33	6.627
Practical Psychodermatology	30	6.024
Health Medicine and Human Development	25	5.020
Pediatric Psychodermatology	25	5.020
Hautarzt	12	2.410
Journal of the European Academy of Dermatology and Venereology	11	2.209
Postepy Dermatologii i Alergologii	10	2.008
Journal of Cosmetic Dermatology	8	1.606
Author	Institution	Country
Bewley A	Bart's Health NHS Trust	UK
Jafferany M	Michigan University	USA
Reichenberg JS	University of Texas	USA
Taylor RE	Bart's Health NHS Trust	UK
Magid M	University of Texas	USA
Gieler U	University Hospital of Giessen and Marburg	Germany
Goulding JMR	Heart of England NHS Foundation Trust	UK
Harth W	Charité – Universitätsmedizin Berlin	Germany
Koo J	University of California	USA
Poot F	Université Libre De Bruxelles	Belgium
Organizations	Country	
Bart's Health NHS Trust	UK	48
Central Michigan University	USA	41
Royal London Hospital	UK	32
University of London	UK	31
University of California System	USA	21
Queen Mary University London	UK	17
Western Michigan University	USA	13
Heart of England NHS Foundation Trust	UK	12
Justus Liebig University Giessen	Germany	12
Université Libre de Bruxelles	Belgium	12
Total	498	100

^a Total percentage may exceed 100% because certain items were included in more than one category.

Table 2. The ten most cited manuscripts in psychodermatology literature between 1986 and 2021

Article	Author	Journal Name/Published	Total Citation	Average Citations per Year
Psychodermatology: An update	Gupta, MA and Gupta, AK	Journal of the American Academy of Dermatology	164	6.31
Current Psychosomatic Practice	Fava, GA; Cosci, F and Sonino, N	Psychotherapy And Psychosomatics	112	22.4
Psychodermatology: The mind and skin connection	Koo, J and Lebwohl, A	American Family Physician	96	4.57
The use of antidepressant drugs in dermatology	Gupta, MA and Gupta, AK	Journal of the European Academy of Dermatology and Venereology	86	4.1
Psychosocial effect of common skin diseases	Barankin, B and DeKoven, J	Canadian Family Physician	72	3.6
Psychodermatology - Practical Guidelines on Pharmacotherapy	Koo, JYM and Pham, CT	Archives of Dermatology	65	2.17
Improvement of pruritus and quality of life of children with atopic dermatitis and their families after joining support groups	Weber, MB <i>et al.</i>	Journal of the European Academy of Dermatology and Venereology	60	4.29
Psychodermatological aspects of atopic dermatitis	Senra, MS and Wollenberg, A	British Journal of Dermatology	58	7.25
Self-Inflicted Lesions in Dermatology: Terminology and Classification - A Position Paper from the European Society for Dermatology and Psychiatry (ESDaP)	Gieler, U <i>et al.</i>	Acta Dermato-Venereologica	57	6.33
Functional itch disorder or psychogenic pruritus: Suggested diagnosis criteria from the French Psychodermatology Group	Misery, L <i>et al.</i>	Acta Dermato-Venereologica	57	3.8

Table 3. Most used 20 keywords in psychodermatology literature

Keyword (Total link strength)			
1.	Psychodermatology (241)	11.	Skin (23)
2.	Psoriasis (62)	12.	Trichotillomania (21)
3.	Depression (60)	13.	Atopic dermatitis (20)
4.	Quality of life (53)	14.	Psychocutaneous (20)
5.	Dermatology (51)	15.	Psychocutaneous disorders (19)
6.	Anxiety (45)	16.	Psychology (19)
7.	Stress (34)	17.	Pruritus (18)
8.	Psychiatry (32)	18.	Psychotherapy (15)
9.	Body dysmorphic disorder (27)	19.	Vitiligo (15)
10.	Psychosomatic (26)	20.	Stigmatization (14)

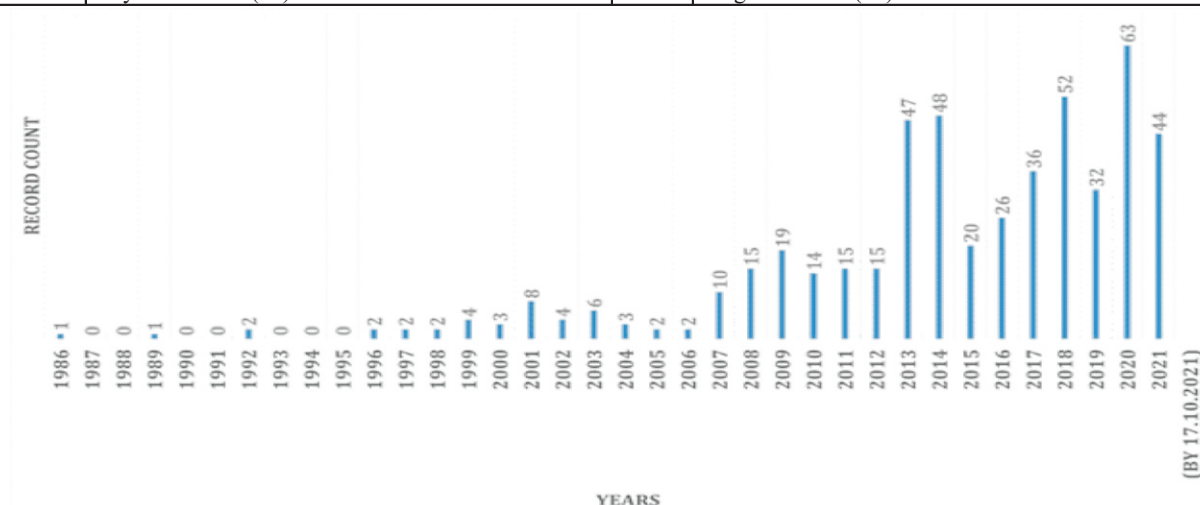


Fig 1. Number of documents by year in psychodermatology literature

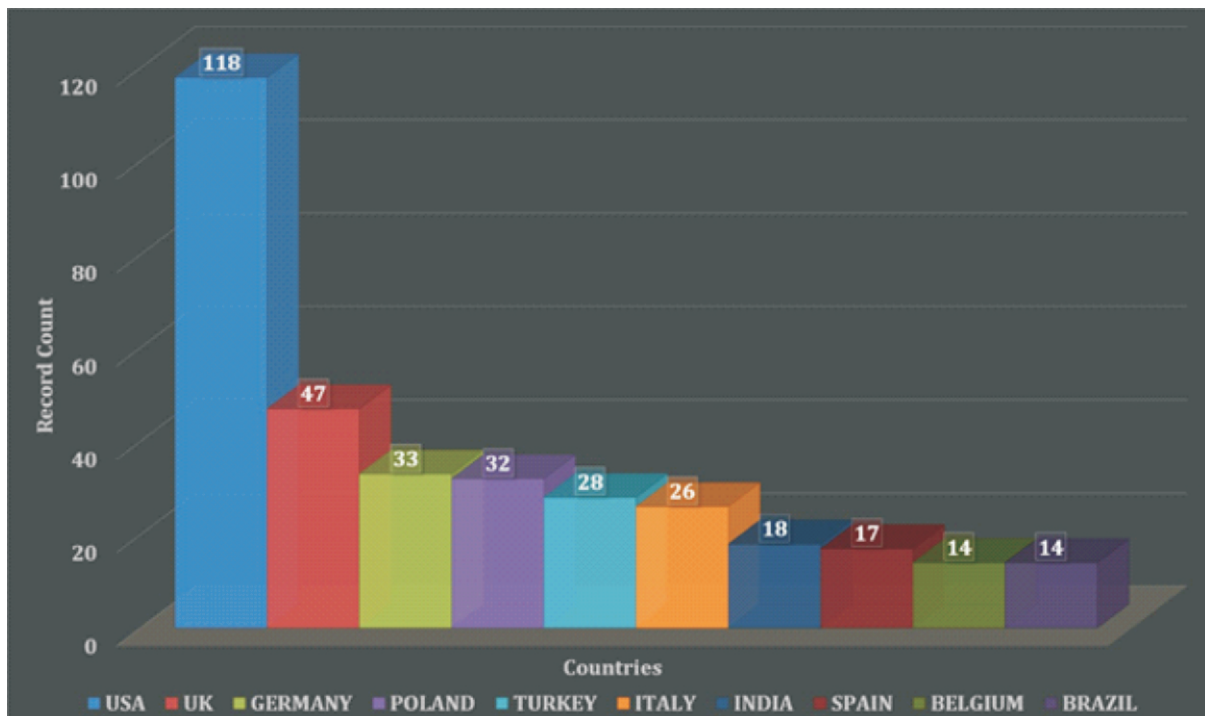


Fig 2. Top ten countries producing psychodermatology papers

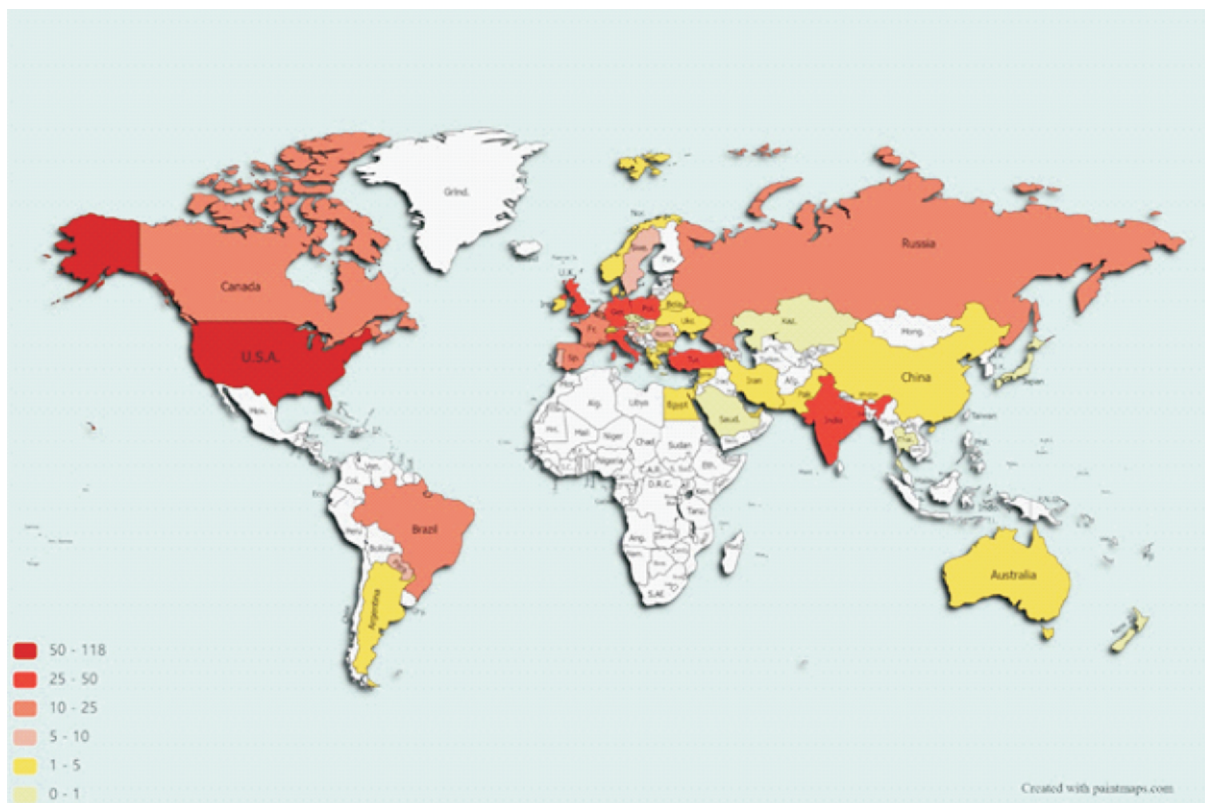


Fig 3. Global distribution of the production in psychodermatology literature

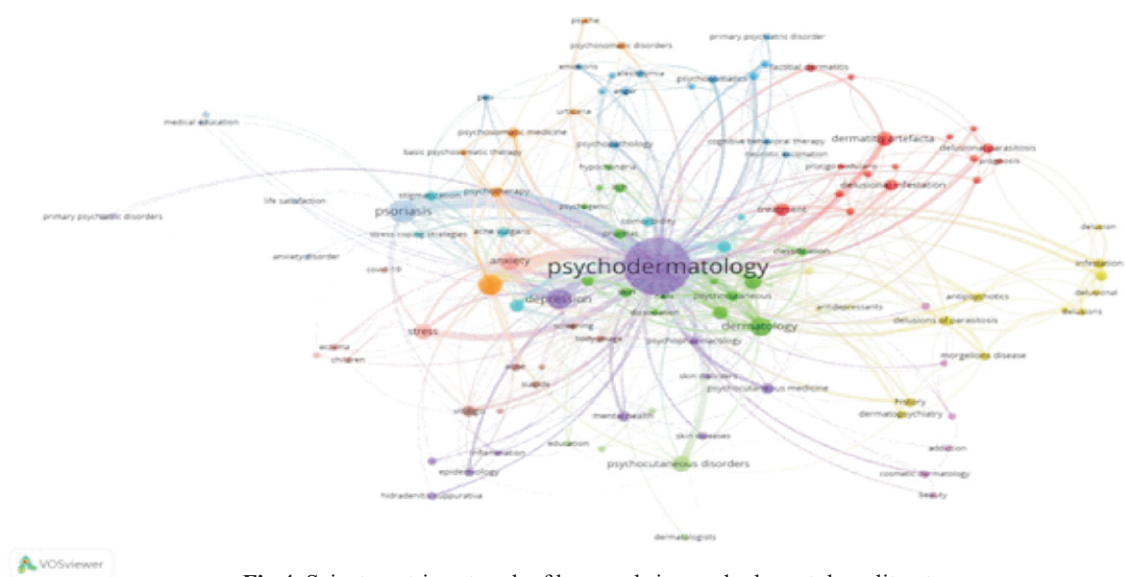


Fig 4. Scientometric network of keywords in psychodermatology literature

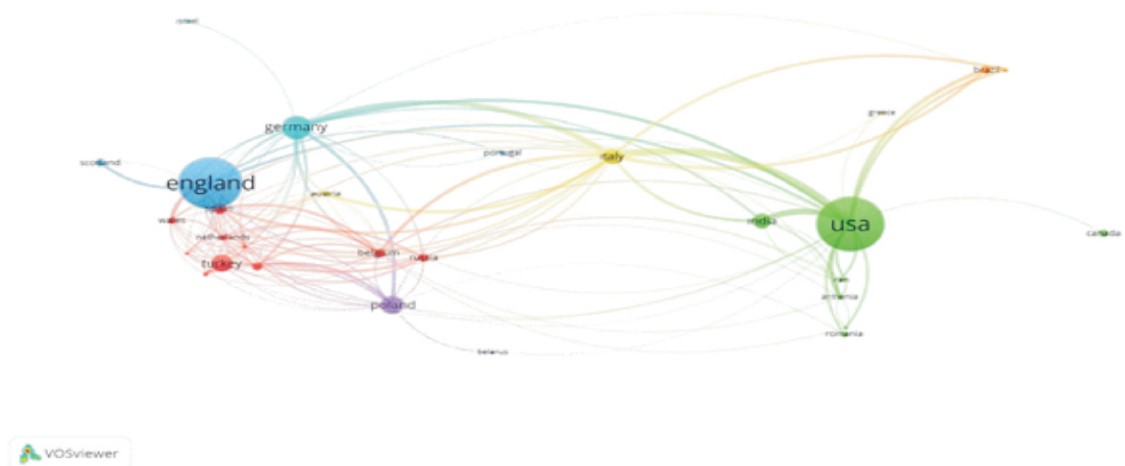


Fig 5. Scientometric network of countries in psychodermatology literature

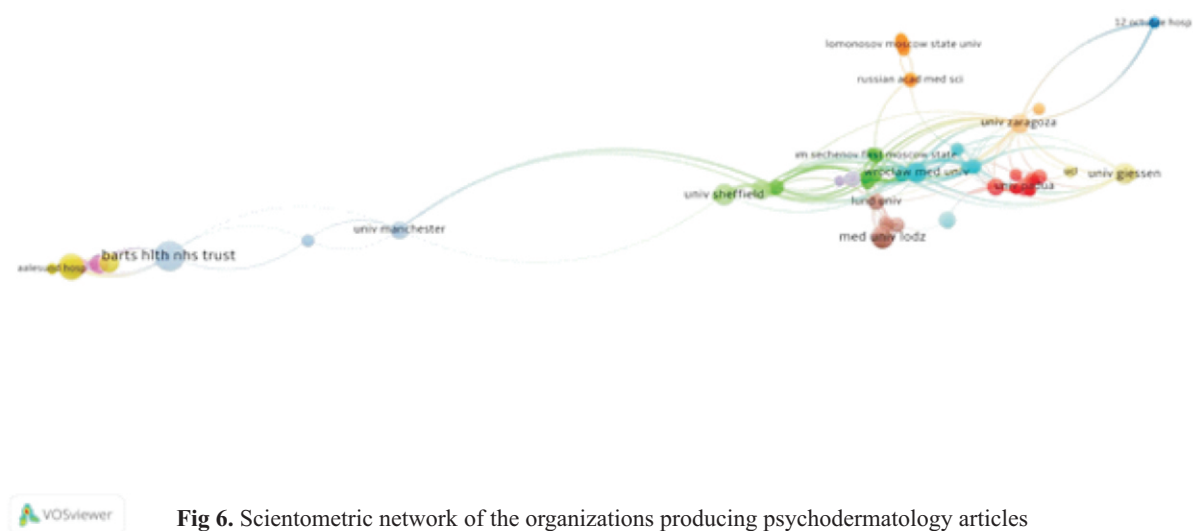


Fig 6. Scientometric network of the organizations producing psychodermatology articles

becomes even more important⁶. So, what role does this connection, which is important in normal physiology, play a role in diseases of both systems? This possible mechanism, which is not yet understood is an area that has increasingly attracted the attention of many dermatologists, psychiatrists, and other specialists, and is the subject of much research. Probably, some psychiatric diseases such as anxiety and stress⁷, schizophrenia⁸, depression⁹ etc. may cause skin diseases, and some skin diseases may cause some psychiatric diseases. This study aimed to provide insight into the evolution of research on psychodermatology using bibliometric network analysis.

Scientometric analyses examine, measure, compare, and objectify activities in scientific and technical research with mathematical and statistical evaluations of certain scientific literature, thus enabling the quantification of some emerging areas, focal points, trends, and networking/collaboration aspects of science. However, it is not easy to evaluate scientific progress; different factors such as technology, culture and economy can interfere with these assessments¹⁰. These studies allow the evaluation of scientific studies of the studied discipline, study subjects, researchers, journals, countries and institutions, and to make determinations about their current status as the result of prior evolution. In light of the findings obtained, evaluations can be made about the progress and scientific stages, as well as future directions. With scientometric research, it is somewhat possible to evaluate the scientific publication policy of a country, as well as to measure the publication performance of researchers or institutions to some degree^{11,12}. WoS is one of the most frequently used citation databases with extensive thematic and geographic coverage of the health sciences. Its data can be processed by various bibliometric analysis software packages¹³⁻¹⁶. The WoS database assigns one or more research areas to each journal to use a more systematic analysis of topics and to highlight the differences between disciplines¹⁷. VOSviewer is a free software that maps data concerning co-occurrence clustering to show the structure, evolution and cooperation of knowledge spaces¹⁸.

In our study, the annual analysis of the publications shows that the number of papers on psychodermatology showed an uneven slow increase from 1986 to 2007 and an unsteady rapid increase from 2007 to 2021. Publications in the last 15

years cover 91.5% of all publications. The most publications were made in 2020 with 63 publications, followed by 52 in 2018. The reason why the number of publications in 2021 is significantly less than in 2020 may be a result of the COVID-19 pandemic. Therefore, results during the COVID-19 pandemic may be inaccurate for scientometric analysis (possibly true for the great majority of medical literature).

To determine research and publication activity, we analyzed countries most active in psychodermatology, the number of articles on national scales, the number of publications of authors, and the number of publications from organizations. As a result of this analysis, we observed that the country with the most publications was the USA with 118 articles, comprising 23.7% of the sample, followed by the UK with 47 articles (9.4%), Germany with 33 articles (6.6%), Poland with 32 articles (6.4%), and Turkey with 28 articles (5.6%). Although the USA contributes greatly to this field, according to a June 2021 update, there were psychodermatology clinics in only seven cities in the USA (Rochester, New York City, Tampa, Saginaw, Madison, Kansas City, San Francisco)^{19,20}. The most important reason for this may be that many of the psychodermatological disorders are not classified in the ICD (International Classification of Diseases) and DSM-5 (Diagnostic and Statistical Manual of the American Psychiatric Association), which still lacks descriptive terminology, resulting in a denial of insurance. Another reason may be that psychodermatology is not recognized in the USA, like in other countries¹⁹. The fact that this contrast exists in the country with the greatest contribution to this field indicates that psychodermatology is currently an area that has many unknowns, is open to development, and requires greater understanding with more scientific research.

While conducting scientometric research on a subject, it may not be sufficient to look at the differences between countries. It may also be necessary to look at the differences in studies between institutions. Because in a country where the number of research on the subject is not high, there may be institutions that have a special interest in that subject. In the present study, it was found that Bart's Health NHS Trust was the institution with the greatest share in overall research on this topic (9.6%), followed by Central Michigan University (8.2%), Royal London Hospital (6.4%),

University of London (6.2%), and University of California (4.2%). Of these organizations that entered the top ten, 5 were in the UK including the leading institution. Three were in the USA, 1 was in Germany and 1 was in Belgium, largely consistent with the top country rankings.

Published articles, citations, and performance of publishing organizations are only a reference when discussing active countries. Cooperation between countries not only has a positive impact on the development of research capabilities but also reflects the international influence of those countries¹⁷. In our study, the USA, the UK, Italy, Germany, and Belgium were detected as the most cooperative countries. Considering that most of these collaborating countries are also the countries with the highest number of published documents and the highest citation frequency, it can be said that this cooperation encourages the development of research on the subject and strengthens international research at the same time.

Scientific articles reflect advances in basic scientific research. Data from the most cited articles provide important insights into the development of the field. Knowing the most cited articles on a scientific subject reinforces the formation of common scientific data on that subject and becomes a useful guide for researchers when authoring their articles on the subject²¹. The most cited article was titled "Psychodermatology: An update" by Gupta and Gupta, published in 1996 in the Journal of the American Academy of Dermatology which provides an overview of psychodermatology focusing on the clinical aspects and psychological treatments of the cutaneous associations of psychiatric disorders and the psychiatric associations of certain known cutaneous disorders, while also providing an update on the use of psychotropic drugs for the treatment of mental disorders associated with skin diseases²². It should be kept in mind that the number of citations for an article is a long-term accumulation and excellent articles also need time to be cited more frequently. In other words, the quality of an article is determined not only by the number of citations, but also by the specific research value, trends, and direction^{17,18}.

It is very important to identify the most influential journals to publish research in any field. This will help researchers interested in that field to follow said journals and publish their research in journals specific to a scientific field²¹. The British Journal of Dermatology was the journal with the

highest number of publications with 86 papers on psychodermatology (17.3%), followed by Acta Dermato-Venereologica (10.4%) and Dermatologic Therapy (6.6%). Seven of the top ten journals reported their field of research was 'Dermatology', while 2 reported 'psychodermatology'. When we look at research fields, it is evident that much of the literature concerning this field is published in dermatology-focused journals with a total of 390 publications (78.3% of all publications). This was followed by Psychiatry with 54 publications and Psychology with 43 publications. The lack of psychiatry journals in the top ten journals and this large difference between the proportion of research fields suggests that this field attracts more attention from dermatologists than psychiatrists, or it is also likely that the patients included in this scope primarily apply to dermatology clinics concerning their skin disorders.

The academics leading this field of research were mostly based in the USA and the UK. Bewley A. from Bart's Health NHS in the UK was the most contributing author with 68 publications (13.7% of all articles in the literature), followed by Jafferany M. with 44 publications from the University of Michigan from the USA, Reichenberg J.S. with 34 publications (University of Texas, USA) and Taylor R.E. (Bart's Health NHS Trust, UK).

There are some limitations of our study. In this analysis, research articles were evaluated only if they could be identified with the following keywords: "psychodermatology", "psychiatry and dermatology", "dermatopsychiatry" or "dermatopathology". A greater number of studies could have been identified with a larger set of keywords; however, this may have also led to the inclusion of relatively less-specific articles. In relation, since this scientometric analysis encompasses a considerably long period, it may have been unable to detect possible short-lived trends in the field and may have missed some relevant studies due to terminological inconsistencies which are yet to be addressed. Finally, since there are no other scientometric analysis studies in the field of psychodermatology, a comparative discussion is impossible.

CONCLUSION

Emphasizing the contributions of productive researchers who have taken part in the development of a particular research field increases the focus of interest of other scientists in that field and can be a source of inspiration and

encouragement for their contributions to that field. There is no other scientometric analysis in the field of psychodermatology. It is possible to say that the interest in the field of psychodermatology is low, but recent years have seen an increasing trend which has been interrupted by COVID-19. In addition, the USA and the UK harbour the most prolific authors in this field. We believe that this study will contribute to establishing new targets for further research by creating awareness regarding psychodermatology. In addition, the current data can provide a good baseline to enable easier decision-making for researchers and policymakers alike, particularly by establishing the development, evolution, and state of the art of research in the field of psychodermatology.

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