



Dermatology Reports

<https://www.pagepress.org/journals/index.php/dr/index>

eISSN 2036-7406



SIDCO
Società Italiana di Dermatologia
Chirurgica, Oncologica, Correttiva ed Estetica



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Please cite this article as: Itzhaki Gabay S, Zlakishvili B, Valdman-Grinshpoun Y, Horev A. The top 100 most cited articles in acne vulgaris: a bibliometric analysis. Dermatol Rep 2023 [Epub Ahead of Print] doi: 10.4081/dr.2024.9886

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Submitted: 04/11/2023 – Accepted 03/12/2023

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The top 100 most cited articles in acne vulgaris: a bibliometric analysis

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Key words: acne vulgaris; bibliometric analysis; citation.

Contributions: SIG, AH, design of the study; SIG, AH, YVG, draft of the manuscript; BZ, statistical analysis; AH, conceived the study. All the authors read and approved the final version to be published.

Conflict of interest: the authors declare no potential conflict of interest.

Funding: none.

Ethical approval and consent to participate: approval from an ethics committee was not required, given that no data collection or intervention in animal or human experiments occurred.

Availability of data and material: data and materials are available by the authors.

Informed consent: the manuscript does not contain any individual person's data in any form.

Abstract

Background. A substantial body of literature has been published on acne vulgaris (AV) in the past five decades. Bibliometric analysis (BA) is a scientific, statistical evaluation review of published articles, providing a quantitative assessment of past research. **Methods.** The Web of Science (webOS) citation indexing database was used on 11 June 2023 to identify the top 100 cited articles on AV. Articles were listed in descending order by their annual citation (AC). Data sets were then subdivided into senior author, year and age of publication, journal and its impact factor, the number of total citations according to the webOS, corresponding and senior author's affiliated institution, country of origin, manuscript type, study design, and research focus. **Results.** The top 100 most cited articles were published between 1974 and 2020. The mean number of citations ranges between 82 and 688. The most cited paper was *Guidelines of care for the management of Acne Vulgaris* by Zaenglein, with an AC of 98.2. The largest number of manuscripts was published between 2001 and 2010 (n = 47). The *British Journal of Dermatology* had the highest number of published manuscripts (15). Of the original research papers, 28% were of a level of evidence 1, 56% focused on treatment, 19.5% on epidemiology, and 16.5% on pathogenesis. **Conclusions.** This analysis provides detailed bibliometric characteristics, highlighting the worldwide acne burden, with the hope that future researchers will explore the gaps in the AV literature.

Introduction

Acne vulgaris (AV) is a multifactorial, polymorphic inflammatory skin disease targeting the pilosebaceous unit, most commonly distributed along the face and, less frequently, the back and chest (1). Its global estimated prevalence is around 9.4% (2)–(3), making it the eighth most prevalent disease worldwide (4).

Significant comorbidities have been associated with acne (5), such as permanent scarring, depression, low self-esteem, embarrassment, anxiety, and suicidal ideation, negatively influencing the quality of life (6).

Bibliometric analysis (BA) is a scientific, statistical evaluation review of published articles, providing a quantitative assessment of past research. In addition, it presents important messages and conclusions for physicians and investigators in a specific field and predicts research areas that need further investigation. Several fields in dermatology have been explored by BA, including atopic dermatitis (7)–(8), psoriasis(9), nail psoriasis(10), psoriatic arthritis(11), melanoma (12), hidradenitis suppurative(13)–(14), and rosacea(15). However, to date, no BA of AV has been published.

In the current BA, we described the literature shaping AV practice by identifying important bibliometric characteristics in the top 100 cited AV papers over the last 50 years.

Materials and Methods

Search strategy

The top 100 most cited articles on acne were retrieved from the webOS citation indexing database on 11 June 2023 (16)(17). To encompass the trends over the years, we decided to include publications that AV appeared in their title in the past 50 years, with no limitation on languages or document types. Approval from an ethics committee was not required, given that no data collection or intervention in animal or human experiments occurred.

Data extraction and bibliometric parameters

The top 100 most cited articles on acne were extracted to Microsoft Excel 2019. The search result directly led to the retrieval of the title, total citations (TCs) by webOS database and publisher site, journal, year of publication, senior author, and manuscript type. Annual citation (AC), the division of TCs by how old the publication is, has been described as a tool to counter the bias arising from older publications having more prominent citations over time (18) (19) (20). The study design and research focus were determined by screening the abstract, available full text, and keywords of the 100 articles. Country and institution were recorded according to the senior author's information. Finally, the webOS usage count since 2013, which states the number of times users accessed the study via full text since 2013, was extracted directly from the search result.

Statistical analysis

Statistical analysis was done on Jasp©. Normality of data was assessed using the Shapiro-Wilk test, and statistical differences were evaluated using the Mann-Whitney U test for non-parametric values.

Results

A total of 2,909 studies were retrieved, with the top 100 cited articles published between 1974 and 2020, ranked by AC and listed in Table 1.

Year of publication

The increase in publications began after 1990, reaching its peak between 2001 and 2010 (n = 47) (Table 1).

Citations

The TCs of the 100 articles ranged between 82 and 688, with a sum of 14,701 and a median of 112.5. Figure 1 shows the citation analysis for the mean AC and TC in each 10-year interval. The webOS usage count declines as the AC of publications lowers, showing a respective relationship in both as the publication rank degrades. (Table 1).

Countries, institutions, and senior authors

The articles were sorted by country of origin, indicating that the US (n= 44), the UK (n= 12), and Germany (n= 6) were the countries that published the most cited articles concerning AV (Table 1). After controlling for population, these three countries were still those with the greatest number of publications on AV, in the following order: UK (1.77754E-07), US (1.30066E-07), and Germany (7.19685E-08). The most published countries, affiliated institute, senior author, and their respective number of articles are listed in *Supplementary Table 1*. The University of California(n= 5) was the most affiliated institution, and Professor William J Cunliffe was the most published senior author(n= 5).

Journal of publication

The 100 articles were published in 36 different journals, with 76% of the papers being in the field of dermatology(Fig 2). Of these articles, the largest number was published in the *British Journal of Dermatology* (n= 15), followed by the *Journal of the American Academy of Dermatology* (n= 14) and *Archives of Dermatology* (n= 10). The top five most published journals and their impact factors are listed in *Supplementary Table 2*.

Article design and research focus

Of the 100 most cited articles, 72 were original articles, 23 were reviews, and five were editorial materials.

The original articles were then classified into different research focuses: treatment (56%), epidemiology (19.5%), pathogenesis (16.5%), and others (8%) (Fig. 3). Of the original articles that focus on treatment, 55% were clinical trials (n= 22), 33% were randomized controlled trials (n= 13) (RCT`s) and 28% of the original articles had a level of evidence (LOE) of 1 (Fig. 4). Between 2001 and 2010, there was a surge in treatment focused original articles compared to prior decades (Fig. 3). When analyzing the rise with respect to study design, analysis shown that the higher volume of publications is a result of a higher number of RCT`s (n= 13) and clinical trials. (n=10) Out of the 13 RCT`s, three were about the effect of a low-glycemic diet on AV and five were about phototherapy and laser therapy for AV. When examining the difference between the AC and TC of RCT`s and clinical trials between 2001 and 2010 compared to the RCT`s and clinical trials in the remaining

articles, the various periods differences in TC were not statistically significant, whereas the AC between 2001 and 2010 were significantly higher than the remaining articles ($R_{AC} = 0.43$, $p = 0.02$), with regards to RCT's and clinical trials. Further analysis has raised three recurring themes: children ($n = 8$), mental morbidity ($n = 5$), and diet ($n = 4$).

Of the original articles that were focused on treatment, 33% were about photo and laser therapy for acne, and of the epidemiology-related articles, 43% focused on adolescence. (Table 1)

Discussion and Conclusions

In the current BA, we present the main highlights and changes that have taken place over the years, explain the differences regarding publication, and conduct conclusions that may help improve the general understanding of acne, eventually leading to better treatment. The top cited acne articles were published between 1974 and 2018. However, a substantial surge was noted between 2001 and 2012, in which 47 articles were published on AV (Table 1). This might be explained by the treatment research focus, also surging that decade (Fig. 3). Photodynamic therapy (PTD) was the therapy of interest that decade, trying to find better treatment modalities than Isotretinoin due to its significant cutaneous and systemic side effects (21,22). Photodynamic therapy success is mainly due to sebaceous glands' destruction, leading to decreased sebum production (22), (23). Yet, there is no consensus on performing PDT for AV therapy (22), (24).

In addition, the surge in treatment research focus is likely due to the growing interest in the aesthetics, beautification, and cosmetology fields that have accelerated since 1990 (25). The sharp decline in publishing articles between 2012 to 2022 is due to a lower treatment research focus (Fig. 3). The only article published regarding treatment that decade was the guideline (top cited) that arranged all the former treatment modalities. The high ACs of this article can be attributed to the importance of guidelines that presents updated grading, classification, and management options for a certain disease (26). This points out that treatment modalities for AV should be further investigated to find an appropriate therapy.

The median and the mean TCs rate for AV are 113 and 142.73, respectively, placing AV relatively behind psoriatic arthritis (265.9)¹⁵ and melanoma (526)¹⁶, emphasizing that AV needs to be further investigated and will be a growing field in the future research.

The average of TC was ascending parallel to the increase in AC (Fig. 1). In addition, a strong positive correlation was found between ranking by ACs and the respective decline in webOS usage count since 2013 (Table 1), supporting the idea that BA should rank cited articles according to ACs to counter the bias that older papers have a greater chance of being cited (27). Our analysis indicated that most of the top cited articles sorted by country of origin after controlling

for the population were the UK, the US, and Germany. This finding might be attributed to the global burden of acne disease, which may vary according to patient demographics (4) (28) (29). Acne is most significant in Western Europe (including the UK and Germany), high-income North America, and southern Latin America. In addition, it may also be related to improved recording and high healthcare accessibility in those countries. More than that, acne was the most common reason for visiting a dermatologist below 18 years of age (30) and the most common skin condition across the US (31). Economically related, annual acne cost is enormously high in US and Germany (estimated at \$3 billion (32) and over 400 million euros/ year (33), respectively). Another potential reason for the difference between the number of articles published among the countries (Table 1) is the high glycemic index aspect associated with acne (34), (35). For example, the US ranked 12th highest obesity country worldwide due to an increased glycemic index diet (36) (37), compared to Japan, in which the traditional Japanese diet is known to prevent obesity (38).

The majority of the top cited articles were published in the *British Journal of Dermatology*, followed by the *Journal of the American Academy of Dermatology* and the *Archives of Dermatology* (S2). This finding might be attributed to the countries in which these journals are published, also related to the acquired trend in which researchers are more likely to select high IF journals for citations (S1).

The epidemiology of acne ranked second behind treatment in the research focuses. According to our results, out of the epidemiological articles, three were concerning the psychiatric and psychological impact of acne (39) (40) (5), seven were regarding the prevalence of acne in adolescence (5,39,41–45), and two focused on the incidence of *Propionibacterium Acnes* (46,47). In addition, an obvious peak of RCTs studies between 2003 and 2012 was noticeable (Fig. 4). Out of them, four were concerning the low glycemic diet on AV (34) (35) (48) (49).

Only nine articles were related to the pediatric population; seven papers that focused on epidemiology, were about children's quality of life, one was about acne risk factors, and one revealed the psychological aspect of children with acne. As a result, the main question arises- is the current treatment for acne, a common skin disease influencing approximately 85% of teenagers, satisfactory? The current study had several limitations. First, our citation analysis didn't exclude the influence of self-citation, which may point out that citation ranking does not always measure quality but rather awareness of a specific topic and degree of recognition. In addition, older articles had higher chances of being cited, and even the most cited papers have no citations when they are just published (27). Our analysis tried to correct this bias by ranking the articles according to ACs.

In conclusion, our study provides a detailed BA of the top 100 cited articles related to AV in the last five decades, analyzing acne's epidemiology and treatment modalities.

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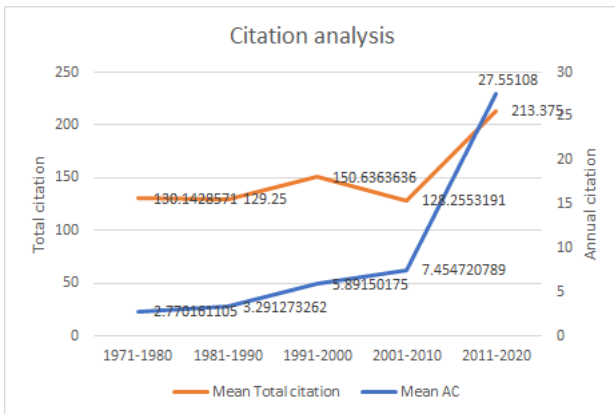


Figure 1. Citation analysis of the top 100 most cited articles as presented by total citation (TCs) and annual citation (ACs) in each 10-year interval.

Figure 3. Distribution of original articles with a research focus by decade.

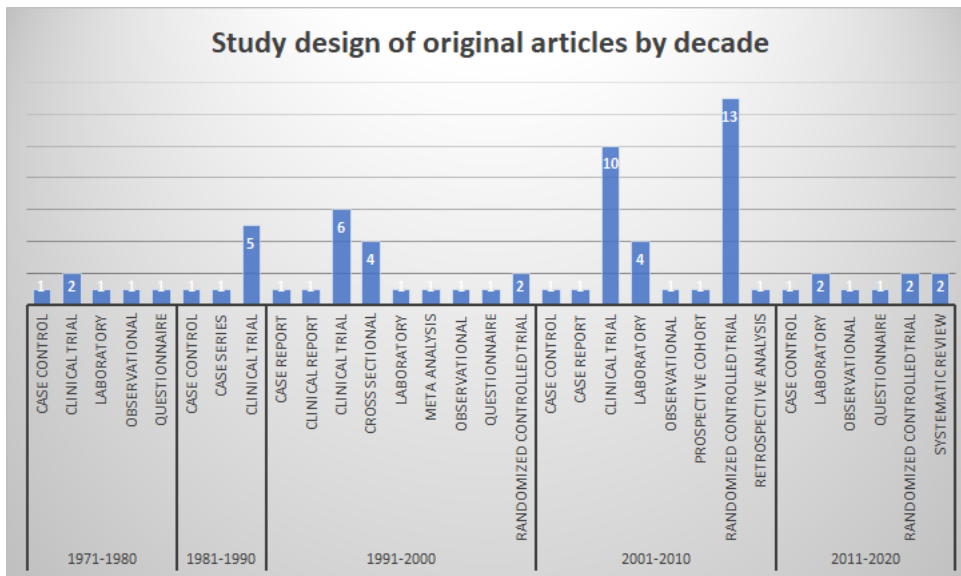


Figure 4. Distribution of study design by decade.

Table 1. Top 100 cited articles on acne vulgaris retrieved from the Web of Science database.

No.	Title	Senior author	Year	Journal	Total citation	Annual Citation	Country of origin	Institution affiliation	Study design	Research focus
1	Guidelines Of Care for The Management Of Acne Vulgaris	Bhushan, R	2016	Journal of the American Academy of Dermatology	617	102.83	United States of America	American academy of Dermatology	Systematic review	Treatment
2	Acne Vulgaris	Garner, S	2012	Lancet	582	58.20	United States of America	Tufts Medical Center	Review	Comprehensive review

3	Cutibacterium Acnes (Propionibacterium Acnes) And Acne Vulgaris: A Brief Look At The Latest Updates	Roques, C	2018	Journal of the European Academy of Dermatology and Venereology	181	45.25	France	Centre National de la Recherche Scientifique	Review	Pathogenes
4	Epidemiology Of Acne Vulgaris	Williams, HC	2013	British Journal of Dermatology	380	42.22	United Kingdom	University of Nottingham	Review	Epidemiology
5	Staphylococcus Epidermidis In The Human Skin Microbiome Mediates Fermentation To Inhibit The Growth Of Propionibacterium Acnes: Implications Of Probiotics In Acne Vulgaris	Huang, CM	2014	Applied Microbiology and Biotechnology	237	29.63	United States of America	University of California	Laboratory	Pathogenes
6	Host-Microbiome Interactions And Recent Progress Into Understanding The Biology Of Acne Vulgaris	Gallo, RL	2018	Microbiome	105	26.25	United States of America	University of California	Review	Pathogenes
7	Acne Vulgaris	Zouboulis, CC	2015	Nature Reviews Disease Primers	162	23.14	Germany	Dessau Medical Center	Review	Comprehensive review
8	The Epidemiology Of Acne Vulgaris In Late Adolescence	Dellavalle, RP	2016	Adolescent Health Medicine and Therapeutics	136	22.67	United States of America	University of Colorado	Review	Epidemiology
9	Guidelines Of Care For Acne Vulgaris Management	Bhushan, R	2007	Journal of the American Academy of Dermatology	309	20.60	United States of America	American Academy of Dermatology	Review	Treatment

10	Topical Ala-Photodynamic Therapy For The Treatment Of Acne Vulgaris	Anderson, RR	2000	Journal of Investigative Dermatology	382	17.36	United States of America	Harvard University	Clinical trial	Treatment
11	Antimicrobial Property Of Lauric Acid Against Propionibacterium Acnes: Its Therapeutic Potential For Inflammatory Acne Vulgaris	Huang, Cm	2009	Journal Of Investigative Dermatology	223	17.15	United States of America	National Central University	Laboratory	Treatment
12	Propionibacterium Acnes Induces An Il-17 Response In Acne Vulgaris That Is Regulated By Vitamin A And Vitamin D	Kim, J	2014	Journal of Investigative Dermatology	123	15.38	United States of America	University of california	Laboratory	Basic science
13	Acne Vulgaris - A Disease Of Western Civilization	Brand-Miller, J	2002	Archives of Dermatology	299	14.95	Australia	University of Sydney	Observational	Epidemiology
14	An Increased Incidence Of Propionibacterium Acnes Biofilms In Acne Vulgaris: A Case-Control Study	Alexeyev, OA	2012	British Journal of Dermatology	133	13.30	Sweden	Umea University	Case control	Epidemiology
15	Phototherapy With Blue (415 Nm) And Red (660 Nm) Light In The Treatment Of Acne Vulgaris	Chu, A	2000	British Journal of Dermatology	262	11.91	United Kingdom	Imperial College London	Clinical trial	Treatment
16	Review Of The Innate Immune Response In Acne Vulgaris: Activation Of Toll-Like Receptor 2 In Acne Triggers Inflammatory Cytokine Responses	Kim, J	2005	Dermatology	189	11.12	United States of America	University Of California Los Angeles	Review	Pathogenesis

17	Role Of Insulin, Insulin-Like Growth Factor-1, Hyperglycaemic Food And Milk Consumption In The Pathogenesis Of Acne Vulgaris	Schmitz, G	2009	Experimental Dermatology	141	10.85	Germany	University of Regensburg	Review	Pathogenes
18	The Effect Of A High-Protein, Low Glycemic-Load Diet Versus A Conventional, High Glycemic-Load Diet On Biochemical Parameters Associated With Acne Vulgaris: A Randomized, Investigator-Masked, Controlled Trial	Varigos, GA	2007	Journal of the American Academy of Dermatology	159	10.60	Australia	Royal Melbourne Hospital	Randomized controlled trial	Pathogenes
19	A Low-Glycemic-Load Diet Improves Symptoms In Acne Vulgaris Patients: A Randomized Controlled Trial	Varigos, GA	2007	American Journal of Clinical Nutrition	157	10.47	Australia	Royal Melbourne Hospital	Randomized controlled trial	Pathogenes
20	Topical Aminolaevulinic Acid-Photodynamic Therapy For The Treatment Of Acne Vulgaris: A Study Of Clinical Efficacy And Mechanism Of Action	Cunliffe, Wj	2004	British Journal of Dermatology	186	10.33	United Kingdom	Cardiff University	Clinical trial	Treatment
21	Photodynamic Therapy Of Acne Vulgaris Using 5-Aminolevulinic Acid Versus Methyl Aminolevulinate	Wulf, HC	2006	Journal of the American Academy of Dermatology	154	9.63	Denmark	University of Copenhagen	Randomized controlled trial	Treatment
22	Photodynamic Therapy Of Acne Vulgaris Using Methyl Aminolaevulinate: A Blinded,	Wulf, HC	2006	British Journal of Dermatology	149	9.31	Denmark	University of Copenhagen	Randomized controlled trial	Treatment

	Randomized, Controlled Trial									
23	The Impact Of Acne Vulgaris On Quality Of Life And Psychic Health In Young Adolescents In Greece. Results Of A Population Survey	Rigopoulos, D	2012	Anais Brasileiros De Dermatologia	93	9.30	Greece	National & Kapodistria n University of Athens	Questionnaire	Epidemiolo
24	Treatment Of Acne Vulgaris	Shaw, JC	2004	JAMA - Journal of The American Medical Association	166	9.22	Canada	University of Toronto	Editorial	Treatment
25	Acne Vulgaris, Probiotics And The Gut-Brain-Skin Axis - Back To The Future?	Logan, AC	2011	Gut Pathogens	100	9.09	Canada	Integrat Care Ctr Toronto	Review	Basic scienc
26	A Review Of The Use Of Combination Therapies For The Treatment Of Acne Vulgaris	Leyden, JJ	2003	Journal of the American Academy of Dermatology	172	9.05	United States of America	University of Pennsylvania	Review	Treatment
27	Recent Findings In The Epidemiologic Evidence, Classification, And Subtypes Of Acne Vulgaris	White, Gm	1998	Journal of the American Academy of Dermatology	210	8.75	United States of America	West Virginia University	Review	Epidemiolo
28	Clinical And Histological Effect Of A Low Glycaemic Load Diet In Treatment Of Acne Vulgaris In Korean Patients: A Randomized, Controlled Trial	Suh, DH	2012	Acta Dermato-Venereologica	86	8.60	South Korea	Seoul National University	Randomized controlled trial	Treatment

29	Acne Vulgaris And The Quality Of Life Of Adult Dermatology Patients	Chren, Mm	1998	Archives Of Dermatology	204	8.50	United States of America	Vanderbilt University	Questionnaire	Epidemiologic
30	Photodynamic Therapy For Acne Vulgaris: A Critical Review From Basics To Clinical Practice Part I. Acne Vulgaris: When And Why Consider Photodynamic Therapy?	Anderson, RR	2010	Journal of the American Academy of Dermatology	101	8.42	United States of America	Harvard University	Review	Treatment
31	In Vitro Evaluation Of Antibacterial, Anticollagenase, And Antioxidant Activities Of Hop Components (Humulus Lupulus) Addressing Acne Vulgaris	Ono, M	2009	Phytomedicine	109	8.38	United States of America	Betal LLC	Laboratory	Basic science
32	The Effect Of A Low Glycemic Load Diet On Acne Vulgaris And The Fatty Acid Composition Of Skin Surface Triglycerides	Mann, NJ	2008	Journal of Dermatologic Science	116	8.29	Australia	Royal Melbourne Institute of Technology	Randomized controlled trial	Pathogenesis
33	Photodynamic Therapy Of Acne Vulgaris With Topical Delta-Aminolaevulinic Acid And Incoherent Light In Japanese Patients	Ishibashi, A	2001	British Journal of Dermatology	171	8.14	Japan	National Defense Medical College	Clinical trial	Treatment
34	Comparison Of The Epidemiology Of Acne Vulgaris Among Caucasian, Asian, Continental Indian And African American Women	Kimball, AB	2011	Journal of the European Academy of Dermatology and Venereology	88	8.00	United States of America	Harvard University	Observational	Epidemiologic

35	Involvement Of The Corticotropin-Releasing Hormone System In The Pathogenesis Of Acne Vulgaris	Zouboulis, CC	2009	British Journal of Dermatology	98	7.54	Germany	Free University of Berlin	Case control	Pathogenes
36	Adapalene-Benzoyl Peroxide, A Fixed-Dose Combination For The Treatment Of Acne Vulgaris: Results Of A Multicenter, Randomized Double-Blind, Controlled Study	Kang, S	2007	Journal of the American Academy of Dermatology	113	7.53	United States of America	University of Michigan	Randomized controlled trial	Treatment
37	Photodynamic Therapy For Acne Vulgaris: A Critical Review From Basics To Clinical Practice Part Ii. Understanding Parameters For Acne Treatment With Photodynamic Therapy	Anderson, RR	2010	Journal of the American Academy of Dermatology	90	7.50	United States of America	Harvard University	Review	Treatment
38	The Assessment Of Acne-Vulgaris - The Leeds Technique	Cunliffe, Wj	1984	British Journal of Dermatology	285	7.50	United Kingdom	Cardiff University	Case series	Diagnosis
39	The Response Of Skin Disease To Stress - Changes In The Severity Of Acne Vulgaris As Affected By Examination Stress	Kimball, AB	2003	Archives of Dermatology	142	7.47	United States of America	Stanford University	Prospective cohort	Pathogenes
40	Scoring Systems In Acne Vulgaris	Thappa, DM	2009	Indian Journal of Dermatology Venereology & Leprology	96	7.38	India	Jawaharlal Institute of Postgraduate Medical Education & Research	Editorial	Diagnosis
41	Pulsed-Dye Laser Treatment For Inflammatory Acne Vulgaris:	Chu, AC	2003	Lancet	134	7.05	United Kingdom	Swansea University	Randomized controlled trial	Treatment

	Randomised Controlled Trial									
42	Therapy For Acne Vulgaris	Leyden, JJ	1997	New England Journal of Medicine	172	6.88	United States of America	University of Pennsylvania	Review	Treatment
43	Norgestimate And Ethinyl Estradiol In The Treatment Of Acne Vulgaris: A Randomized, Placebo-Controlled Trial	Jorizzo, JL	1997	Obstetrics and Gynecology	170	6.80	United States of America	Wake Forest University	Randomized controlled trial	Treatment
44	Topical Retinoids In Acne Vulgaris Update On Efficacy And Safety	Gollnick, H	2008	American Journal of Clinical Dermatology	95	6.79	Germany	Otto von Guericke University	Review	Treatment
45	Comparison Of Five Antimicrobial Regimens For Treatment Of Mild To Moderate Inflammatory Facial Acne Vulgaris In The Community: Randomised Controlled Trial	Williams, HC	2004	Lancet	121	6.72	United Kingdom	University of Nottingham	Randomized controlled trial	Treatment
46	Antimicrobial Activity Of Enterocins From Enterococcus Faecalis SI-5 Against Propionibacterium Acnes, The Causative Agent In Acne Vulgaris, And Its Therapeutic Effect	Park, MY	2009	Journal of Microbiology	86	6.62	South Korea	Catholic University of Korea	Randomized controlled trial	Treatment
47	Topical Methyl Aminolaevulinate Photodynamic Therapy For Treatment Of Facial Acne Vulgaris: Results Of A	Wennberg, AM	2006	British Journal of Dermatology	105	6.56	Sweden	Sahlgrenska University Hospital	Randomized controlled trial	Treatment

	Randomized, Controlled Study									
48	A Population-Based Analysis Of Laboratory Abnormalities During Isotretinoin Therapy For Acne Vulgaris	Manos, M	2006	Archives of Dermatology	104	6.50	United States of America	Kaiser Permanente	Retrospective analysis	Epidemiology
49	Blue And Red Light Combination Led Phototherapy For Acne Vulgaris In Patients With Skin Phototype Iv	Park, MY	2007	Laser In Surgery and Medicine	97	6.47	South Korea	National Medical Center - Korea	Clinical trial	Treatment
50	Acne Vulgaris	Webster, GF	2002	British Medical Journal	129	6.45	United States of America	Jefferson University	Review	Treatment
51	Peroxidated Squalene Induces The Production Of Inflammatory Mediators In Hacat Keratinocytes: A Possible Role In Acne Vulgaris	Picardo, M	2006	Journal of Investigative Dermatology	102	6.38	Italy	IRCCS San Gallicano Dermatological Institute	Laboratory	Pathogenesis
52	An Aqueous Gel Fixed Combination Of Clindamycin Phosphate 1.2% And Benzoyl Peroxide 2.5% For The Once-Daily Treatment Of Moderate To Severe Acne Vulgaris: Assessment Of Efficacy And Safety In 2813 Patients	Chen, D	2008	Journal of the American Academy of Dermatology	89	6.36	United States of America	Dow Pharmaceut	Randomized controlled trial	Treatment
53	Comparison Of Depression, Anxiety And Life Quality In Acne Vulgaris Patients Who Were Treated With Either	Taner, Y	2009	International Journal of Dermatology	82	6.31	Turkey	Ufuk University	Clinical trial	Treatment

	Isotretinoin Or Topical Agents									
54	Anxiety, Depression, And Nature Of Acne Vulgaris In Adolescents	Sanli, B	2000	International Journal of Dermatology	134	6.09	Turkey	Pamukkale University	Cross sectional	Epidemiologic
55	The Efficacy Of 5% Topical Tea Tree Oil Gel In Mild To Moderate Acne Vulgaris: A Randomized, Double-Blind Placebo-Controlled Study	Iraji, F	2007	Indian Journal of Dermatology Venereology & Leprology	91	6.07	India	Isfahan University Medical Science	Randomized controlled trial	Treatment
56	A Randomized, Double-Blind Comparison Of A Clindamycin Phosphate/Benzoyl Peroxide Gel Formulation And A Matching Clindamycin Gel With Respect To Microbiologic Activity And Clinical Efficacy In The Topical Treatment Of Acne Vulgaris	Levy, SF	2002	Clinical Therapeutics	118	5.90	United States of America	Dermik Labs	Clinical trial	Treatment
57	Treatment Of Acne Vulgaris With A Pulsed Dye Laser - A Randomized Controlled Trial	Voorhees, JJ	2004	JAMA - Journal of The American Medical Association	104	5.78	United States of America	University of Michigan	Randomized controlled trial	Treatment
58	Low-Dose Isotretinoin In The Treatment Of Acne Vulgaris	Grunwald, MH	2006	Journal of the American Academy of Dermatology	91	5.69	Israel	Ben Gurion University	Clinical trial	Treatment

59	Acne Vulgaris In Skin Of Color	Strachan, D	2002	Journal of the American Academy of Dermatology	113	5.65	United States of America	Mount Sinai St. Luke's	Review	Treatment
60	Isotretinoin And The Risk Of Depression In Patients With Acne Vulgaris: A Case-Crossover Study	Berard, A	2008	Journal of Clinical Psychiatry	79	5.64	Canada	Universite de Montreal	Case crossover	Complicati
61	Clinical Considerations In The Treatment Of Acne Vulgaris And Other Inflammatory Skin Disorders: Focus On Antibiotic Resistance	Webster, GF	2007	Cutis	84	5.60	United States of America	Jefferson University	Review	Treatment
62	Treatment Of Inflammatory Facial Acne Vulgaris With Intense Pulsed Light And Short Contact Of Topical 5-Aminolevulinic Acid: A Pilot Study	Choawawanich, P	2006	Dermatologic Surgery	89	5.56	Thailand	Inst Dermatol, Dept Dermatologic & Laser, Bangkok	Clinical trial	Treatment
63	A Comparison Of The Efficacy And Safety Of Adapalene Gel 0.1% And Tretinoin Gel 0.025% In The Treatment Of Acne Vulgaris: A Multicenter Trial	Czemielewski, J	1996	Journal of the American Academy of Dermatology	142	5.46	United States of America	Galderma R&D SNC	Clinical trial	Treatment
64	Effectiveness Of Norgestimate And Ethinyl Estradiol In Treating Moderate Acne Vulgaris	Swinyer, LJ	1997	Journal of the American Academy of Dermatology	136	5.44	United States of America	Icahn School of Medicine at Mount Sinai	Randomized controlled trial	Treatment

65	Acne-Vulgaris In Premenarchal Girls - An Early Sign Of Puberty Associated With Rising Levels Of Dehydroepiandrosterone	Ratterman, J	1994	Archives of Dermatology	150	5.36	Canada	Cincinnati Children's Hospital Medical Center	Cross sectional	Pathogenes
66	Human Beta Defensin-1 And-2 Expression In Human Pilosebaceous Units: Upregulation In Acne Vulgaris Lesions	Muller-Rover, S	2001	Journal of Investigative Dermatology	109	5.19	Germany	University of Hamburg	Laboratory	Pathogenes
67	Physiopathology Of Acne Vulgaris: Recent Data, New Understanding Of The Treatments	Dreno, B	2004	European Journal of Dermatology	93	5.17	France	Nantes Universite	Review	Treatment
68	A Pilot Study Of Icg Laser Therapy Of Acne Vulgaris: Photodynamic And Photothermolysis Treatment	Altshuler, GB	2003	Laser In Surgery and Medicine	96	5.05	United States of America	Palomar Med Prod Inc	Clinical trial	Treatment
69	Isotretinoin For Acne-Vulgaris - 10 Years Later - A Safe And Successful Treatment	Cunliffe, Wj	1993	British Journal of Dermatology	146	5.03	United Kingdom	Leeds General Infirmary	Clinical trial	Treatment
70	Acne-Vulgaris - The Adolescents Albatross	Garfield, E	1992	Essays of an Information Scientist	150	5.00	United States of America	Clarivate	Expert opinion	Comprehensive review
71	Is Acne Vulgaris A Genuine Inflammatory Disease?	Zouboulis, CC	2001	Dermatology	101	4.81	Germany	Free University of Berlin	Editorial	Basic science
72	A Comparison Of The Efficacy And Tolerability Of Adapalene 0.1% Gel Versus Tretinoin 0.025% Gel In Patients With Acne Vulgaris: A Meta-Analysis Of Five Randomized Trials	Verschoor, M	1998	British Journal of Dermatology	113	4.71	France	Galderma R&D SNC	Meta analysis	Treatment

73	Photodynamic Therapy For Acne Vulgaris With Topical 5-Aminolevulinic Acid	Ishibashi, A	2000	Archives of Dermatology	102	4.64	Japan	National Defense Medical College	Case report	Treatment
74	Treatment Of Inflammatory Facial Acne Vulgaris With The 1450-Nm Diode Laser: A Pilot Study	Goldberg, LH	2004	Dermatologic Surgery	83	4.61	United States of America	University of Texas	Clinical trial	Treatment
75	Inflammation In Acne-Vulgaris	Webster, GF	1995	Journal of the American Academy of Dermatology	124	4.59	United States of America	Jefferson University	Review	Pathogenes
76	Nonablative Radiofrequency For Active Acne Vulgaris: The Use Of Deep Dermal Heat In The Treatment Of Moderate To Severe Active Acne Vulgaris (Thermotherapy): A Report Of 22 Patients	Gomez, JB	2003	Dermatologic Surgery	87	4.58	Argentina	Universidad Catolica de Murcia	Case report	Treatment
77	Pro-Inflammatory Levels Of Interleukin-1-Alpha-Like Bioactivity Are Present In The Majority Of Open Comedones In Acne-Vulgaris	Cunliffe, Wj	1992	Journal of Investigative Dermatology	136	4.53	United Kingdom	University of Leeds	Laboratory	Pathogenes
78	Propionibacterium Levels In Patients With And Without Acne-Vulgaris	Kligman, Am	1975	Journal Of Investigative Dermatology	209	4.45	United States of America	University Of Pennsylvania	Case control	Epidemiolc
79	Light Therapy In The Treatment Of Acne Vulgaris	Lezelter, J	2004	Dermatologic Surgery	80	4.44	Israel	Dermatol & Lasers Clin, Tel Aviv	Review	Treatment

80	The Prevalence Of Common Skin Conditions In Australian School Students: 3. Acne Vulgaris	Marks, R	1998	British Journal of Dermatology	105	4.38	Australia	University of Melbourne	Cross sectional	Epidemiologic
81	Prevalence Of Facial Acne-Vulgaris In Late Adolescence And In Adults	Gould, DJ	1979	British Medical Journal	186	4.33	United Kingdom	Leeds General Infirmary	Questionnaire	Epidemiologic
82	Predictors Of Severity Of Acne Vulgaris In Young Adolescent Girls: Results Of A Five-Year Longitudinal Study	Sorg, NW	1997	Journal of Pediatrics	108	4.32	United States of America	Cincinnati Children's Hospital Medical Center	Observational	Epidemiologic
83	Salicylic Acid Peels For The Treatment Of Acne Vulgaris In Asian Patients	Kim, IH	2003	Dermatologic Surgery	82	4.32	South Korea	Korea University	Clinical trial	Treatment
84	The Development Of An Acne Quality Of Life Scale: Reliability, Validity, And Relation To Subjective Acne Severity In Mild To Moderate Acne Vulgaris	Gupta, AK	1998	Acta Dermatovenereologica	102	4.25	Canada	University of Toronto	Clinical report	Diagnosis
85	Topical Nicotinamide Compared With Clindamycin Gel In The Treatment Of Inflammatory Acne-Vulgaris	Chalker, DK	1995	International Journal of Dermatology	104	3.85	United States of America	Augusta University	Clinical trial	Treatment
86	Acne Vulgaris	Shalita, AR	1998	Lancet	92	3.83	United States of America	State University of New York	Review	Comprehensive review
87	Phototherapy Of Acne Vulgaris With Visible Light	vanWeelden, H	1997	Dermatology	83	3.32	Netherlands	Utrecht University	Clinical trial	Treatment
88	Plasma Androgens In Women With Acne-Vulgaris	Rich, BH	1983	Journal of Investigative Dermatology	117	3.00	United States of America	University of Chicago	Case control	Epidemiologic

89	A Dose-Response Study Of 13-Cis-Retinoic Acid In Acne-Vulgaris	Cunliffe, Wj	1983	British Journal of Dermatology	107	2.74	United Kingdom	University of Leeds	Clinical trial	Treatment
90	Ultrastructural Observations In Acne-Vulgaris - Normal Sebaceous Follicle And Acne Lesions	Knutson, DD	1974	Journal of Investigative Dermatology	131	2.73	United States of America	University of Oregon	Observational	Pathogenesis
91	Oral Spironolactone Improves Acne-Vulgaris And Reduces Sebum Excretion	Wise, P	1984	British Journal of Dermatology	103	2.71	United Kingdom	Imperial College London	Clinical trial	Treatment
92	Comparing 2.5-Percent, 5-Percent, And 10-Percent Benzoyl Peroxide On Inflammatory Acne-Vulgaris	Comite, H	1986	International Journal of Dermatology	95	2.64	United States of America	Boston University	Clinical trial	Treatment
93	Acne-Vulgaris In Early Adolescent Boys - Correlations With Pubertal Maturation And Age	Elder, N	1991	Archives of Dermatology	79	2.55	United States of America	Cincinnati Children's Hospital Medical Center	Cross sectional	Epidemiologic
94	Oral Spironolactone - An Effective Treatment For Acne-Vulgaris In Women	Wise, P	1986	British Journal of Dermatology	86	2.39	United Kingdom	Imperial College London	Clinical trial	Treatment
95	The Microbial Colonization Of Inflamed Acne-Vulgaris Lesions	Cunliffe, Wj	1988	British Journal of Dermatology	81	2.38	United Kingdom	University of Leeds	Observational	Basic science
96	Testosterone-Metabolism In Skin - Review Of Its Function In Androgenetic Alopecia, Acne-Vulgaris, And Idiopathic Hirsutism Including Recent Studies With Antiandrogens	Price, VH	1975	Archives of Dermatology	103	2.19	United States of America	University of California	Review	Basic science

97	Various Parameters For Grading Acne-Vulgaris	Smith, JG	1982	Archives of Dermatology	86	2.15	United States of America	Augusta University	Clinical trial	Diagnosis
98	Studies On Mechanism Of Action Of Topical Benzoyl Peroxide And Vitamin-A Acid In Acne-Vulgaris	Bradley, S	1974	Journal of Cutaneous Pathology	103	2.15	United States of America	Acne Research Institute, Miami	Clinical trial	Treatment
99	Topically Applied Antibiotics In Acne-Vulgaris - Clinical Response And Suppression Of Corynebacterium-Acnes In Open Comedones	Stoughton, RB	1976	Archives of Dermatology	86	1.87	United States of America	University of California	Clinical trial	Treatment
100	Complement Activation In Acne-Vulgaris - Invitro Studies With Propionibacterium Acnes And Propionibacterium Granulosum	Nilsson, UR	1978	Infection and Immunity	82	1.86	Sweden	Uppsala University	Laboratory	Basic science

Supplementary Material

Table S1. The number of publications in the three countries with the most published articles on acne, the affiliated institution, and senior authors with the largest numbers of publications, and the respective number of published articles.

Table S2. The number of publications by the five journals with the most articles on acne vulgaris and the journal's impact factor (2022).