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CONTACT DERMATITIS

**Review Article**

# Bibliometrics, dermatology and contact dermatitis

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Although the fields of bibliometrics and citation analysis have existed for many years, relatively few studies have specifically focused on the dermatological literature. This article reviews citation-based research in the dermatology journals, with a particular interest in manuscripts that have included *Contact Dermatitis* as part of their analysis. Overall, it can be seen that the rise of bibliometrics during the mid-20th century and its subsequent application to dermatology has provided an interesting insight into the progression of research within our discipline. Further investigation of citation trends and top-cited papers in skin research periodicals would certainly help complement the current body of knowledge.

*Key words:* bibliometrics; citation analysis; contact dermatitis; dermatology; impact factor.


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Bibliometrics can be described as the use of mathematical techniques to investigate publishing and communication patterns in the distribution of information (1). The examination of where and when references are cited, otherwise known as *citation analysis*, represents one of the most common methods in this field. Citation analysis and its application for scientific journals was pioneered by Eugene Garfield in the mid-1950s, and from early on it had been noticed that a relatively small group of core journals were collecting the majority of citations. To help facilitate the dissemination and retrieval of scientific literature (2) Garfield founded the *Institute for Scientific Information* (ISI) and produced the journal *Impact Factor* as a means for comparing periodicals regardless of their size, given that smaller journals would be disadvantaged if evaluation methods relied solely on publication numbers or citation counts (3). The field of citation analysis has continually evolved since that time, particularly in recent years, as researchers now use increasingly comprehensive data sets and analytical techniques to establish trends and patterns in the academic literature.

## Bibliometrics in Dermatology

The application of bibliometrics and citation analysis to the dermatological literature appears to have been relatively recent. One of the earliest studies of citation indexing in dermatology was published by Norris (4) in 1989, although it only focused on one journal, *The Journal of Investigative Dermatology* (JID). In his article, Norris (4) reported that the median impact factor for all dermatology periodicals during 1986 was 0.542 and that the JID ranked 158th out of 4316 journals listed in the *Journal Citation Reports*®, with an impact factor of 3.735. In the same year, Saurat (5) wrote a bibliographic article for the 50th anniversary issue of the JID, and a list of the 200 most-cited articles from the JID was also published (6). In 1992, Arndt (7) spoke of the 'information excess in medicine', reporting how dermatological trainees were now spending an average of 17 h per month reading medical journals. In 1993, Dubin et al. (8) published one of the first comprehensive studies of citation classics across a broad range of dermatology periodicals, finding that the half-life of the average citation classic was about 10 years. In the same journal, Anderson (9) suggested that the impact factor was useful for identifying what was 'hot' in dermatology and that review articles on popular clinical topics seemed to have the best impact. By 1994, other associated topics such as the scope-adjusted impact factor and reference accuracy in the dermatological literature had been investigated by Arndt (10) and George and Robbins (11), respectively. In the same year, Van Hooydonk et al. (12) conducted a bibliotheconomic analysis of impact factors within different scientific disciplines, reporting that the

'average' impact factor for journals in dermatology and venereal diseases was 0.925.

By 1995, an information explosion was beginning to occur in the field of dermatology, with Arndt and Dubin (13) describing how physicians were now being inundated by an 'ever swelling river of information'. In the same year, Dubin and Arndt (14) calculated a variety of impact factors for 17 top-ranked dermatology journals, although some of their data may have been flawed (15). In 1996, Dubin and Arndt (16) revisited citation data published between 1981 and 1994 in the top-ranked, peer-reviewed international dermatology journals, thereby identifying institutions with researchers who had made a significant impact on the dermatological literature during this period. The homelands of top-cited authors in dermatology were investigated by Dubin and Arndt (17) in 1997, with the authors finding that slightly more than half of all manuscripts received by the JID during 1994 had originated from outside the USA.

In 1999, Stern and Arndt published various articles describing the growth of international contributors to dermatological literature (18), top-cited authors in dermatology (19) as well as an analysis of classic and near classic articles in the field (20). In their papers, the authors reported that international representation in the dermatological literature was increasing (18) and that a relatively small proportion of all authors were accounting for a high proportion of all citations of the dermatological literature (19). Furthermore, the authors also reported that only 6.5% of all original articles had been cited more than 25 times and that relatively few articles were cited at least 25 times (20). In 1999, Lee and Lee (21) published an investigation of reference accuracy in two Asian dermatological journals, finding that the rate of citation errors was unacceptably high in the *Journal of Dermatology* and the *Korean Journal of Dermatology*; errors that they believed significantly diminished the value of reference lists. Although there were many individual examples, errors in the title and author names were shown to be the most common.

The issue of top-cited authors in dermatological journals was revisited by Stern and Arndt (22) in the year 2000, with the authors reporting that top-cited authors in dermatology journals were also frequently publishing their work in high-impact medical journals. Similarly, Nguyen and Moy (23) also published a paper during the year 2000 which investigated authors in the field of dermatology, although their study only focused on a single journal, *Dermatologic Surgery*. In 2001, Jemec (24) published an investigation of impact factor trends among dermatological journals between 1991 and 2000. In 2002, Didierjean (25) recalculated impact factors for the journal *Dermatology*, finding that 'letters' counted more towards the impact factor of their journal than for other periodicals in the field. In 2003, Potter (26) reviewed the seminal historical contributions to dermatology, mainly from early texts and atlases, although detailed citation analysis of the material itself was not performed.

In 2005, Wilgus et al. (27) published an article describing 'skin related publications' between 1966 and 2003, with a list of the top 101 skin-related articles based on citation counts. In the same year, Dunst et al. (28) analysed original contributions in three top-ranking dermatology journals (the *Archives of Dermatology*, the *British Journal of Dermatology* and the *Journal of the American Academy of Dermatology*). By the early 21st century, various authors had analysed dermatological publications by country, with a comparative study of dermatological research in Denmark and Israel by Enk and Levy (29) in 2003, a study of dermatological articles from the Gulf Cooperation Council countries by Al-Aboud et al. (30) in 2004, a bibliometric analysis of dermatology in central Europe (1991–2002) published by Jemec and Nybaek (31) in 2006, and a study of country origin among papers in the top four journals of dermatology (1995–2004) by Rees and Bisset (32). In 2006, Smoller (33) published an interesting editorial comparing the journal impact factor in dermatology and classical music; while most recently, Dellavalle et al. (34) published a method for refining journal impact factors in the field of dermatology by using *PageRank*.

## Bibliometrics and Contact Dermatitis

Specialist topics will always require specialist journals for the dissemination of literature (24), and a scientific revolution following the Second World War led to many benefits in the field of contact dermatitis (35). A major consequence was increased recognition of subgroups within dermatology, particularly for clinicians and researchers who were interested in the relationships between exposure to various chemical substances and the subsequent onset of dermatitis. *Contact Dermatitis* journal was founded in 1975 with Dr Charles Calnan as Editor-in-Chief (35), having evolved from the *International Contact Dermatitis Research Group* and the Scandinavian contact dermatitis group during the 1970s, the latter which had been producing an informal newsletter to exchange scientific information for some years

(35). Further historical details on the journal's development are described elsewhere (36). Despite having over 30 years publishing history and for reasons that are not clearly apparent, relatively few bibliographic investigations in the field of dermatology have included *Contact Dermatitis* in their calculations. Early impact factor scores for the journal have been published by various authors, however, usually as part of larger investigations and analyses of the dermatological literature.

According to Norris (4) for example, the journal's impact factor score in 1986 was 0.78, although this had dropped slightly to 0.75 in 1993 (14). Although it was not an impact factor as such, Stern and Arndt (19) reported that *Contact Dermatitis* had received 18 478 citations to 3926 articles in the ISI database between 1981 and 1996. According to the same authors in 1999 (20), only 5% of articles published in *Contact Dermatitis* had been cited over 25 times, as opposed to 6.45% of all articles in the dermatological literature. In a 2001 article describing impact factor trends in dermatology, Jemec (24) reported that the impact factor trend for *Contact Dermatitis* between 1991 and 2000 was 0.151, whereas the coefficient of variation over the same time period was 0.162. According to Enk and Levy (29), the average impact factor of *Contact Dermatitis* between 1995 and 1997 was 0.932. In Didierjean's (25) analysis of dermatology impact factors for the year 2001, it was shown that the journal scored 1.016 when 'letters' were not included in the analysis and 0.967 when they were. This suggests that letters from dermatology journals may often be cited, particularly when they contain substantial findings of clinical significance. In a PageRank refinement of impact factors by Dellavalle et al. (34), the impact factor of our journal was 1.095 in 2003, with a refined 'Y-factor' score of 0.0699. Later in 2006, Menne and Agner (37) reported that the impact factor had risen dramatically to 2.701 in 2005, although this had fallen slightly to 2.45 by 2006 (38).

The rise of bibliometrics during the mid-20th century and its subsequent application to dermatology has proven to be a mixed blessing for researchers and clinicians in our field. In some sense, the performance indicators often used for assessing journals, such as the impact factor, have proved to be useful. This view must be tempered with the fact that, as Jellinek et al. (39) have pointed out, the concept of 'impact' itself is rather subjective and the grading scientific journals in this regard will always be difficult. According to Smoller (33), attention must still be paid to the issue if a journal wishes to continuously attract top-quality researchers to publish within their periodicals. From a structural perspective, Jemec (24) has suggested that new journals in dermatology should also be encouraged, as this will help to increase the impact factor of dermatological journals in general. However, according to Dellavalle et al. (34), current measures of journal status in the field of dermatology do not incorporate survey data from dermatologists regarding which journals they actually esteem most.

There have always been a few structural disadvantages when using impact factors to rank journals in the smaller medical subdisciplines (40). Firstly, given that impact factors themselves are derived from citation counts over the previous 2 years, the length of time it takes for important work to be cited by others will greatly affect the scores in a particular field. In a study of citation classics from clinical dermatological journals for example, Dubin et al. (8) reported that the average classic article was published in 1969 and peaked in popularity 9 years after publication. This suggests that dermatology itself is a relatively slow-paced discipline, particularly when compared with other scientific fields with rapid discovery and publication times, such as molecular biology or genetics. Secondly, however, when publishing and analysing citation frequency and impact factors in the field of dermatology, it is important not to lose sight of the main goal in clinical practice.

## Conclusion

Although bibliometrics and citation analysis no doubt provides an interesting insight into the academic progression of our discipline, as suggested by Marks (41) in 1999, there will always be a need to keep a balance between art and science in the field of clinical dermatology, 'lest we rely too much on the modern reductionist approach to defining clinical skills and rely too little on the lessons learned from history on the value of the bedside' (p. 344). Even so, from this review it can be seen that more citation-based research could still be conducted in the field of dermatology, with further investigation of citation trends and top-cited papers in skin research being recommended to help complement the existing body of knowledge.

## References

1. Diodato V. *Dictionary of Bibliometrics*, Binghampton, Haworth Press, 1994.
2. Garfield E. The evolution of the Science Citation Index. *Int Microbiol* 2007: 10: 65–69.
3. Garfield E. The history and meaning of the journal impact factor. *JAMA* 2006: 295: 90–93.
4. Norris D A. The Scientific Citation Index and The Journal of Investigative Dermatology. *J Invest Dermatol* 1989: 92: 147S–148S.

5. Saurat J H. Fifty years of clinical research in The Journal of Investigative Dermatology. *J Invest Dermatol* 1989: 92: 132S–141S.
6. Sulzberger M B. The 200 most cited articles from The Journal of Investigative Dermatology. *J Invest Dermatol* 1989: 92: 142S–147S.
7. Arndt K A. Information excess in medicine. Overview, relevance to dermatology, and strategies for coping. *Arch Dermatol* 1992: 128: 1249–1256.
8. Dubin D, Hafner A W, Arndt K A. Citation classics in clinical dermatologic journals. Citation analysis, biomedical journals, and landmark articles, 1945-1990. *Arch Dermatol* 1993: 129: 1121–1129.
9. Anderson P C. Considering excellence. *Arch Dermatol* 1993: 129: 1188.
10. Arndt K A. My journal is smaller than your journal. *Am J Dermatopathol* 1994: 16: 231–2.
11. George P M, Robbins K. Reference accuracy in the dermatologic literature. *J Am Acad Dermatol* 1994: 31: 61–64.
12. Van Hooydonk G, Gevaert R, Milis-Proost G, Van De Sompel H, Debackere K. A bibliotheconomic analysis of the impact factors of scientific disciplines. *Scientometrics* 1994: 30: 65–81.
13. Arndt K A, Dubin D. Peering at the dermatology literature. *Arch Dermatol* 1995: 131: 602–603.
14. Dubin D B, Arndt K A. The impact of dermatology journals. *Arch Dermatol* 1995: 131: 1059–1060.
15. Saurat J H. The impact factor of dermatology. *Dermatology* 1995: 191: 362.
16. Dubin D B, Arndt K A. Organizational impact in the dermatologic literature. *Arch Dermatol* 1996: 132: 1293–4.
17. Dubin D B, Arndt K A. The homelands of top-cited articles. *Arch Dermatol* 1997: 133: 21–22.
18. Stern R S, Arndt K A. Growth of international contributors to dermatologic literature. *Arch Dermatol* 1999: 135: 1074–1076.
19. Stern R S, Arndt K A. Top cited authors in dermatology: a citation study from 24 journals: 1982-1996. *Arch Dermatol* 1999: 135: 299–302.
20. Stern R S, Arndt K A. Classic and near-classic articles in the dermatologic literature. *Arch Dermatol* 1999: 135: 948–950.
21. Lee S Y, Lee J S. A survey of reference accuracy in two Asian dermatologic journals (the Journal of Dermatology and the Korean Journal of Dermatology). *Int J Dermatol* 1999: 38: 357–360.
22. Stern R S, Arndt K A. Top-cited dermatology authors publishing in 5 "high-impact" general medical journals. *Arch Dermatol* 2000: 136: 357–361.
23. Nguyen N Q, Moy R L. Authors in Dermatologic Surgery. *Dermatol Surg* 2000: 26: 1092–1095.
24. Jemec G B. Impact factors of dermatological journals for 1991-2000. *BMC Dermatol* 2001: 1: 7.
25. Didierjean X. "Editors! Check your Impact Factor data!" Letters to Dermatology count more towards the calculation of the Impact Factor than in any other dermatology journal. *Dermatology* 2002: 205: 327–328.
26. Potter B S. Bibliographic landmarks in the history of dermatology. *J Am Acad Dermatol* 2003: 48: 919–932.
27. Wilgus M L, Adcock P A, Takashima A. Volume, trend and citation analyses of skin related publications from 1966 to 2003. *J Dermatol Sci* 2005: 37: 125–136.
28. Dunst K M, Burgdorf W H, Huemer G M, Zelger B. Analysis of original contributions in three dermatology journals. *J Am Acad Dermatol* 2005: 52: 355–359.
29. Enk C D, Levy L. Achievements of dermatological research in Denmark and Israel: a comparative 10-year study. *Int J Dermatol* 2003: 42: 398–401.
30. Al-Aboud F M, Al-Aboud K M, Al-Hawsawi K A, Ramesh V. Dermatological publications in the Gulf Cooperation Council countries. An analysis of 1966-2004 Medline papers. *Saudi Med J* 2004: 25: 1652–1655.
31. Jemec G B, Nybaek H. A bibliometric study of dermatology in central Europe 1991-2002. *Int J Dermatol* 2006: 45: 922–926.
32. Rees J L, Bisset Y. Recent record of the U.K. to publication in top dermatology journals. *Br J Dermatol* 2006: 154: 1016.
33. Smoller B R Impact factor: certainly a factor, but just whom does it impact? Important lessons from another discipline. *J Cutan Pathol* 2006: 33: 458–61.
34. Dellavalle R P, Schilling L M, Rodriguez M A, Van de Sompel H, Bollen J. Refining dermatology journal impact factors using PageRank. *J Am Acad Dermatol* 2007: 57: 116–119.
35. Calnan C D. Editorial note. *Contact Dermatitis* 1975: 1: 1.
36. Smith D R. Impact factors and contact dermatitis. *Contact Dermatitis* 2008: 58: 191–2.
37. Menne T, Agner T. Statistics and impact factor for contact dermatitis 2005. *Contact Dermatitis* 2006: 55: 129.
38. Contact Dermatitis Website. *Contact Dermatitis, Environmental and Occupational Dermatitis* (Available from http://www.blackwellpublishing.com/journal.asp?ref=0105%20131873) (Accessed February 2008).
39. Jellinek N J, Desousa R A, Bernhard J D. The clinical influence of the JAAD. *J Am Acad Dermatol* 2004: 50: 470–474.
40. Smith D R. Historical development of the journal impact factor and its relevance for occupational health. *Ind Health* 2007: 45: 730–742.
41. Marks R. The art, the science, and the practice of dermatology in the next millennium. *Int J Dermatol* 1999: 38: 343–344.

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