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A Comparison of Academic Journal Impact in Dermatology vs. Similarly Sized Medical Specialties

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Abstract
Purpose of review A dearth of research exists on how dermatology compares to similarly sized medical specialties in terms of number of papers published and scholarly impact of top journals. We investigate the impact factor, 5-year impact factor, number of journals with impact factor greater than 2, total documents published, and H5-index of the top 5 journals in dermatology.
Recent findings The impact of journals in dermatology has not been well described in the literature. We review the methods by which the impact of publications can be assessed and present an approach to interpreting the scope and impact of journal publications. We further identify how dermatology compares to similarly sized specialties in terms of such metrics.
Summary Our results reveal that the *Journal of Investigative Dermatology*, the highest-ranking dermatology journal for both impact factor (7.2) and SCImago Journal Rank (2.6), ranked second to last among top journals of comparable size. *Lancet Neurology* and *Gastroenterology*, by comparison, had impact factors of 21.9 and 16.7, respectively. These findings may result from the relatively low number of academic and fellowship-trained dermatologists, as well as the outpatient nature of dermatology. A positive correlation was observed between total number of academic physicians in a field and impact factor, 5-year impact factor, Source Normalized Impact per Paper (SNIP), percentage of journals with an impact factor greater than 2, and H5-index. Further studies could investigate ways to address barriers to research in dermatology to allow for increased scientific impact.

Keywords Academic dermatology · Impact factor · SCImago Journal Rank

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Abbreviations

AJCD	*American Journal of Clinical Dermatology*
FTP	*Fibrogenesis and Tissue Repair*
JAAD	*Journal of the American Academy of Dermatology*
JAMA	*Journal of the American Medical Association*
Derm	*Dermatology*
JID	*Journal of Investigative Dermatology*

Introduction

Journals and researchers commonly use the Institute for Scientific Information (ISI) impact factor to gauge the quality of publications [1]. A journal's impact factor and 5-year impact factor, as determined by ISI, measure the average number of citations received per article in that journal during the two and five preceding years, respectively. Although researchers may use the impact factor to compare journals within a given field, many argue against its use across different fields. Varying average numbers of papers per journal and differences in inherent citation characteristics decrease its reliability [2].

Alternative tools may allow for comparison between different fields. For example, the Source Normalized Impact per Paper (SNIP) measures a journal's contextual citation impact. The SNIP measures the ratio of the journal's citation count per paper and the citation potential in its subject field. This allows for direct comparison of journals in different subject fields. It also takes characteristics of the subject field into account, such as the frequency at which authors cite articles (e.g., the average reference list length in a given field), as well as the extent to which the database used for the assessment covers the field's literature [3].

The SCImago Journal Rank (SJR) indicator measures a journal's influence or prestige. It is a size-independent metric that measures the average prestige per paper in journals by accounting for both the number of citations received by a journal and the importance or prestige of the journals from which such citations come [4]. Finally, the h-index indicates a journal's number of articles (h) that have received at least h citations. The H5-index is the h-index of articles published in the last 5 years.

Dermatology is a relatively small specialty with only 11,363 active US physicians in 2014. Similarly sized medical specialties include anatomic/clinical pathology, hematology and oncology, infectious disease, gastroenterology, nephrology, neurology, otolaryngology, and urology. Little research exists on how the field of dermatology compares to other medical specialty fields of similar sizes in terms of number of papers published and impact factors of top journals. We compare top journals in dermatology to the top journals of similarly sized specialties and discuss possible causes for the differences observed.

Methods

Choice of Top Dermatology Journals

The top 5 dermatology journals were selected for comparison between 2000 and 2014 using the websites SCImago Journal & Country Rank and Journal Metrics by overall impact.

Selection of Specialties for Comparison

The *2014 Physician Specialty Data Book* published by the Association of American Medical Colleges_ENREF_5 was used to select eight specialties of comparable size to *Dermatology*, including four specialties of smaller size and four specialties of larger size.

Choice of Top Journal from each Specialty

SCImago Journal & Country Rank and Journal Metrics were used to select the top journal from each specialty based on the SJR indicator, a size-independent metric that accounts for both the number of citations received by a journal and the importance or prestige of the journals from which such citations come.

Characterization of the Top Journals

SCImago Journal & Country Rank and Journal Metrics were used to determine 2008–2015 impact factors, total documents published, and SJR for each chosen journal. ResearchGate was used to obtain 5-year impact factors and the percentage of journals with an impact factor of greater than 2. Google Scholar was used to obtain the H5-index for each journal. *The New England Journal of Medicine* (NEJM)'s website was used to obtain the total number of articles published by each specialty in the last 10 years.

Statistical Analysis

Spearman's correlation coefficients and corresponding *P* values were calculated using Microsoft Excel using the following variables: percentage of academic physicians per specialty, number of active physicians per specialty, total number of journals per specialty, and total number of academic physicians per specialty for independent variables and impact factor, 5-year impact factor, SNIP, SJR, percentage of journals with an impact factor greater than 2 for dependent variables, and H5-index for a total of 24 (4 × 6) combinations (see Supplemental Material). The total number of academic physicians was calculated by multiplying the total number of physicians per specialty by the percentage of academic physicians per specialty.

Results and Discussion

Trends in Top Dermatology Journals

The *Journal of Investigative Dermatology* (*JID*) had the highest impact factor with a 5-year average of 6.7, as well as the greatest increase over the 5 years (14%) (Supplementary Fig. 1 and Fig. 1). The impact factors of the *Journal of the*

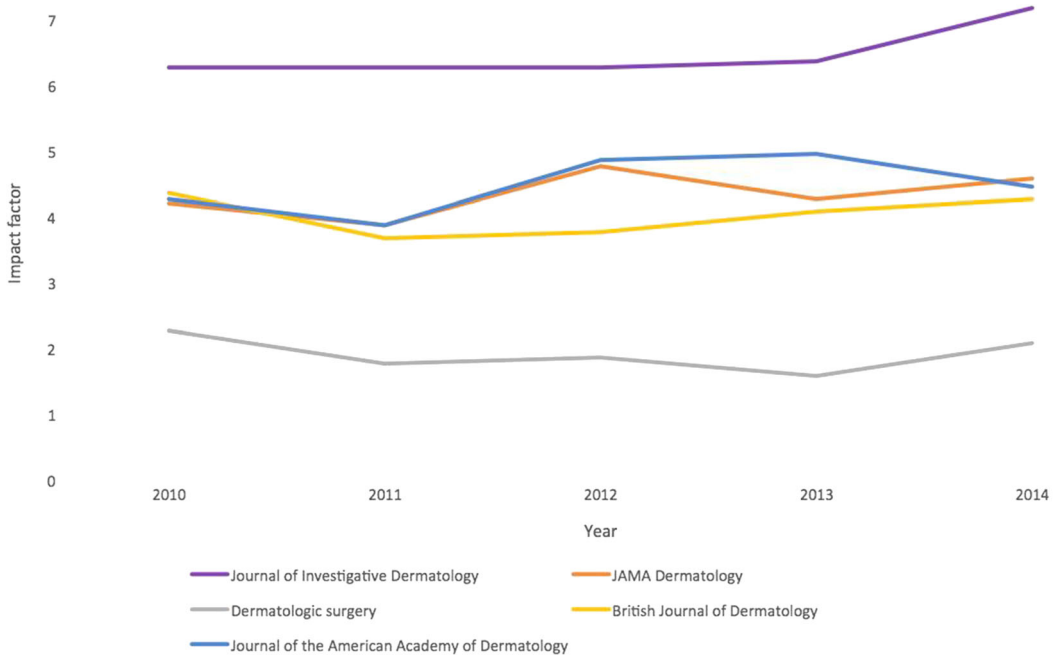

Fig. 1 Trends in impact factors of top *Dermatology* journals. Trends in the impact factors of five top *Dermatology* journals from 2010 to 2014 are displayed

American Medical Association Dermatology (*JAMA Derm*) and the *Journal of the American Academy of Dermatology* (*JAAD*) experienced a net increase of 8.7 and 4.6%, respectively, while the impact factors of *Dermatologic Surgery* and the *British Journal of Dermatology* experienced a net decrease of 8.7 and 2.3%, respectively. Collectively, the top 5 dermatology journals experienced a net increase of 3.3% in impact factors from 2010 to 2014. This is higher than the 1.5% increase in the number of total MEDLINE citations in the same time period. The *JID* was used for comparison against the top journals of similarly sized specialties.

SCImago Journal Rank (SJR) was used as an alternative method for determining scholarly impact among dermatology journals. SJR differs from other metrics insofar as it includes both the number of citations earned by an article and the prestige of journals citing the article. Among dermatology journals, *JID* had the highest SJR in 2015 (2.6). *Fibrogenesis and Tissue Repair* (*FTP*) had the largest growth from 2009 to 2015 (229%) (Supplementary Fig. 5). Interestingly, while *FTP* exhibited the most SJR growth, the total number of documents published by this journal is much lower than that of other dermatology journals (Supplementary Fig. 6).

The authors of this article reached out to editors of several journals that had experienced growth greater than 50% for insight into how journals view impact factor rankings and how they aim to make improvements in their rankings. The editors of the *American Journal of Clinical Dermatology* (*AJCD*) and *FTP* both responded to the inquiries. These editors noted that their strategy focuses on actively commissioning review articles by leading experts, reducing time to publication, providing authors with constructive peer review feedback, selecting the highest quality research studies, providing authors with tools for increased exposure such as open access and social media options, and creating additional subscription packages to meet individual, institutional needs.

Specialties of Similar Size

Four slightly smaller specialties, including infectious disease, otolaryngology, nephrology, and urology, have an average of 9109 active US physicians, while four slightly larger specialties, including neurology, gastroenterology, anatomic/clinical pathology, and hematology and oncology, have an average of 13,567 active US physicians (see Supplementary Fig. 2).

Characteristics of Top Journals of Similarly Sized Fields

Impact Factor

Comparing the top journals of eight similarly sized specialties, *Ear and Hearing*, the top journal of otolaryngology, had the lowest impact factor, 2.8. The *JID*, the top-ranked journal of dermatology, had the next lowest impact factor, 7.2. *Lancet Neurology*, the top-ranked journal in neurology, had the highest impact factor of 21.9 (Fig. 2).

Five-Year Impact Factor

Ear and Hearing had the lowest 5-year impact factor, 3.1. The *JID* had the second lowest 5-year impact factor, 6.7. *Lancet Neurology* had the highest 5-year impact factor of 24.6.

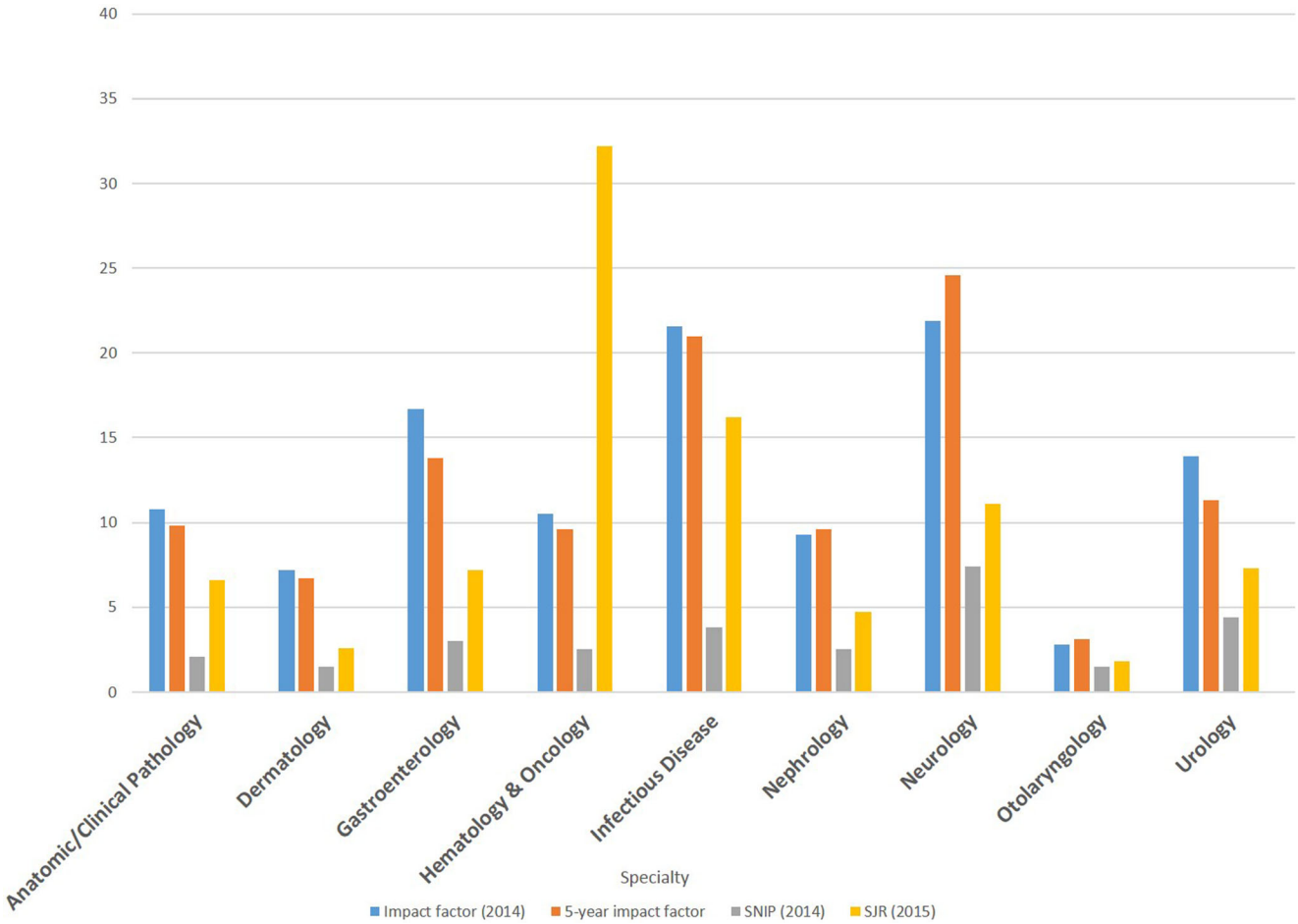

Fig. 2 Top-ranked journal in fields of similar size to *Dermatology*. Impact factor, 5-year impact factor, Source Normalized Impact per Paper, and SCImago Journal & Country Rank are displayed for nine specialties of similar size

Source Normalized Impact per Paper

The *JID* was tied with *Ear and Hearing* for the lowest SNIP (1.5). *Lancet Neurology* had had the highest SNIP of 7.4.

SCImago Journal Rank

Ear and Hearing had the lowest SJR, 1.8. The *JID* had the second lowest SJR, 2.6 though it is of note the *JID* has increased its SJR 129% since 2009. *CA—A Cancer Journal for Clinicians*, the top-ranked journal in hematology and oncology, had an SJR of 32.2. Thirty-one journals from similar sized specialties had SJRs that increase 100% or more from 2005 to 2015 (Supplementary Table 2).

Percentage of Journals with Impact Factor Greater than 2

Otolaryngology has the lowest percentage of journals with an impact factor greater than 2 (12.9%; $n = 13$). Dermatology had the second lowest percentage of journals with an impact factor greater than 2 (21.4%; $n = 28$). Within neurology, 50% ($n = 72$) of journals had impact factors greater than 2 (Fig. 3).

H5-Index (see Supplementary Fig. 3)

Ear and Hearing had the lowest H5-index, 37. The *JID* had the third lowest H5-index, 69. *Gastroenterology*, the top-ranked journal in gastroenterology, had an H5-index of 138.

Articles Published in the NEJM

Anatomic/Clinical Pathology was excluded from analyses as data were not available. *Dermatology* had 583 articles published in the *NEJM* within the last 10 years, greater than urology (323) and otolaryngology (189). *Hematology and Oncology* had the greatest number of articles published within this time frame (1846) (Fig. 4).

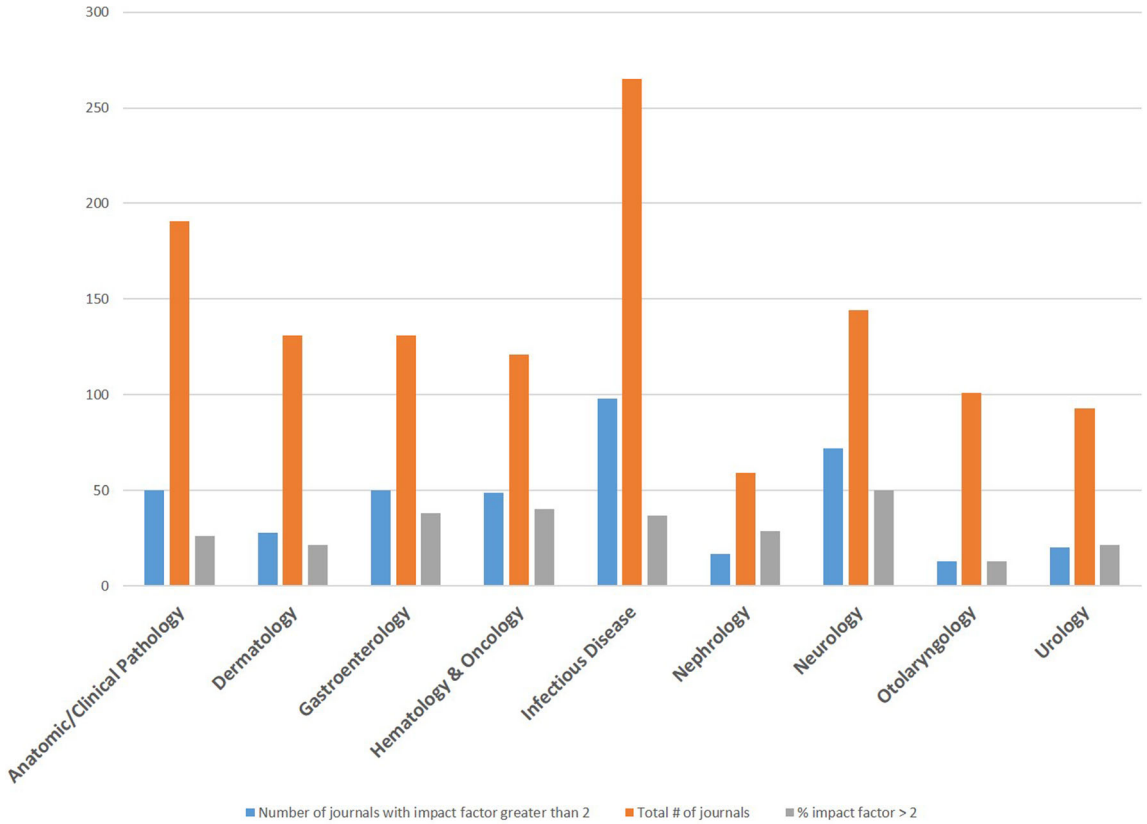

Fig. 3 Number of journals with impact factor greater than 2. The number of journals with an impact factor of greater than 2 is compared to the total number of journals for nine specialties of similar size

Correlational Studies

A positive association existed between number of journals and impact factor as well as 5-year impact factor. Similarly, a positive correlation between total number of academic physicians and impact factor, 5-year impact factor, SNIP, percentage of journals with an impact factor greater than 2, and H5-index was observed (see Supplementary Fig. 4).

Correlations between the specialty-specific number of academic physicians, active physicians, or journals, with impact factor, 5-year impact factor, SNIP, percentage of impact factor greater than 2, and H5-index were not statistically significant (see Supplementary Table 1).

Discussion

The top journal of dermatology, the *JID*, seems to lag behind top journals in similarly sized fields in terms of impact factor, SNIP, SJR, number of journals with impact factor greater than 2, and H5-index. Relatively few dermatology articles are published in *NEJM*, a premier non-specialty-specific journal. This may suggest that the relatively low productivity may not be attributed to the specialty publishing in non-dermatology journals. There are several possible explanations for the observed results.

Dermatologists in academia often participate in research, hospital consults, medical writing, administrative activities, and teaching. At the same time, only 6% of dermatologists practice in academia [5]. Compared to the other specialties of similar size, this percentage is low (Supplementary Table 1) [6–10]. Barriers to conducting research in the private practice setting exist. In this setting, obtaining funding, developing investigational skills, finding reliable research personnel, and allocating time and space to research can be especially challenging [11]. Commonly cited reasons for recruitment problems into academic dermatology include income, politics, and lack of autonomy [12]. Retention problems in academic dermatology also exist and could contribute to a substantial decrease in the growth rate of academic dermatology [13].

Furthermore, relatively few numbers of residents pursue fellowships in dermatology. Only 9.4, 5, and 2% of residents pursue Mohs micrographic surgery, dermatopathology, and pediatric dermatology fellowships, respectively [14]. Fellowship-trained academic dermatologists have a higher mean academic productivity score than non-fellowship-trained dermatologists [15, 16]. The large outpatient component of dermatology may further lend itself to fewer publications as compared to traditionally inpatient fields like gastroenterology, hematology and oncology, nephrology, and neurology.

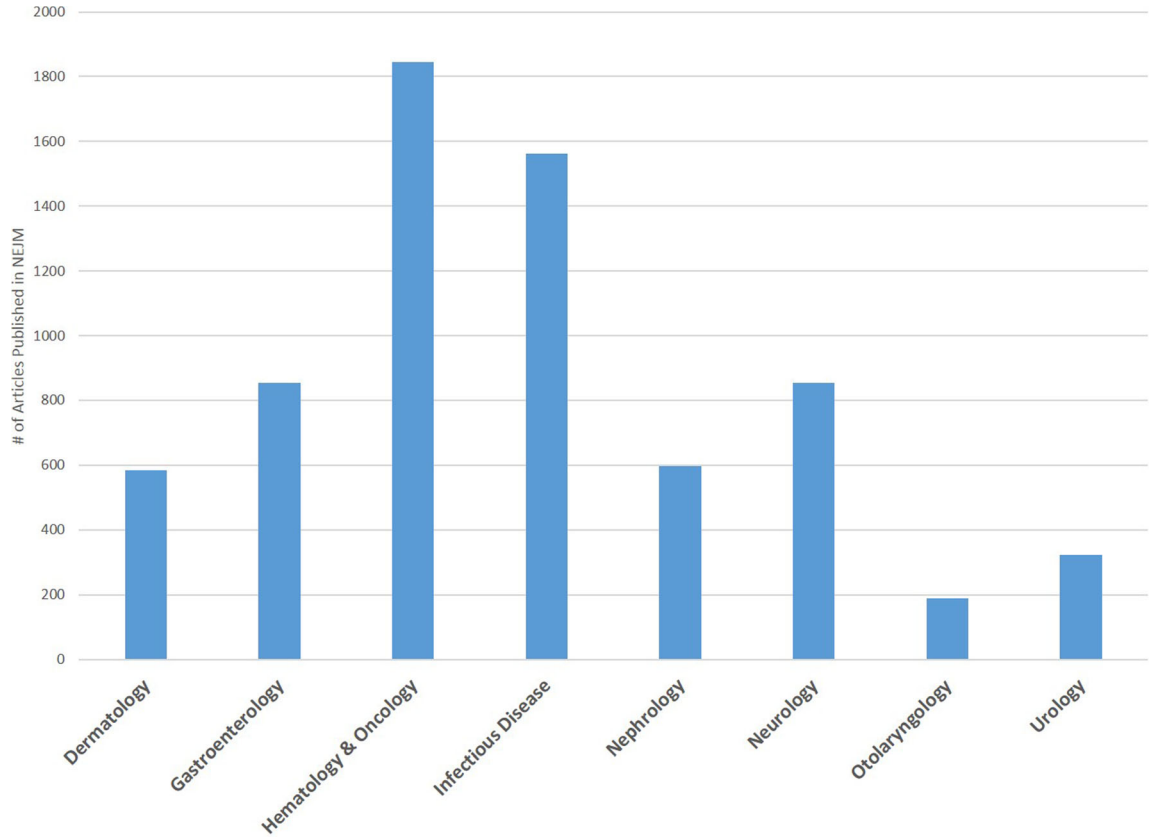

Fig. 4 Number of articles published in the *New England Journal of Medicine* by specialty. The number of articles published in the *New England Journal of Medicine* to date is displayed for eight specialties of similar size. Data were not available for *Anatomic/Clinical Pathology*

A limitation of our analysis is that we did not account for the publications of specialties in non-specialty journals aside from the *NEJM*. It is possible, though unlikely, that specialties differ in the amount with which they publish in non-specialty and specialty-specific journals. Furthermore, standardized comparison of the percentage of academic physicians between specialties is difficult due to variability in reports of this metric. Studies were published at different times and did not consistently define the role of an academic physician. Our study is also limited by its size and scope, and although some correlations were found, they did not achieve statistical significance.

Although dermatology journals seem to be lagging behind in overall impact in comparison to journals of similar size, they are experiencing an increase in impact factor growth above that which is observed in growth of total MEDLINE citations (3.34% compared to 1.52%, respectively). This suggests the need for dermatology journals to place emphasis on publishing higher quality papers.

Conclusions

We conclude that the combination of a relatively low number of academic dermatologists, a low number of fellowship-trained dermatologists, and the outpatient nature of dermatology likely contribute to the overall low impact of dermatology journals in comparison to specialties of similar size. Top dermatology journals, which have seen their scholarly impact improve, report implementing multiple strategies, which include commissioning reviews from experts, reducing publication time, providing quality peer review comments, and increasing journal accessibility. We believe these are valuable lessons and would serve the field of dermatology well as we strive to have our research heard on a larger level.

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Compliance with Ethical Standards

Conflict of Interest Dr. Dellavalle is Social Media Editor for the J. American Academy of Dermatology, Deputy Editor for the Cochrane Skin Group, Dermatology Section Editor for UpToDate, and Online Strategy Editor for the JID.

All other authors declare no conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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