

ORIGINAL ARTICLE

Characterizing the Effect of the COVID-19 Pandemic on the Dermatology Literature

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ABSTRACT

Introduction: The COVID-19 pandemic has impacted multiple aspects of medicine, including research focus and medical literature. Specifically, the dermatology literature has reflected the challenges faced by dermatologists throughout the pandemic¹. Given the widespread interest in understanding the pandemic and its effects on the field of dermatology, we conducted an analysis of the dermatology literature to characterize the literature's impact, content, trends, and the publication process. We anticipated that there would be more interest in dermatology publications pertaining to COVID-19.

Methods: Journal Citation Reports was used to select the 15 dermatology journals with the highest impact factor in 2019, and all articles published in these journals in 2020 were evaluated². Altmetric Attention Score (AAS) was recorded for each article. For COVID-19 related articles, we also assessed whether AAS and citations varied by the type of article (editorial, original article, or guideline) and subspecialty of dermatology to which the article pertained.

Results: Analysis revealed journals prioritized publishing articles related to COVID-19, as the mean time from submission to publication was shorter (43 days) than what has previously been observed. COVID-19 related articles in the dermatology literature received more widespread attention as measured by the average AAS (33 vs. 4 $p < 0.001$) and were higher impact as measured by citation count (11 vs. 1, $p < 0.001$) than non-COVID-19 articles.

Conclusions: These findings demonstrate that dermatology research published regarding the COVID-19 pandemic received broader attention and were higher impact, suggesting the importance and influence of the pandemic for dermatology.

INTRODUCTION

The COVID-19 pandemic has undoubtedly changed medical practice across the globe. Dermatologists have played an integral role in diagnosing and treating various skin conditions related to COVID-19. The

dermatology literature has reflected the challenges faced by dermatologists throughout the pandemic.¹ Given the widespread interest in understanding the pandemic and its effects on the field of dermatology, we conducted an analysis of the dermatology literature to characterize the literature's content, trends, and the

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publication process. Further analysis sought to determine if articles related to the COVID-19 pandemic were more widely disseminated and had a higher impact than other articles published during the same period. We hypothesized that articles related to COVID-19 would be more widely disseminated reflected by higher Altmetric Attention Scores (AAS) and garnered more impact as measured by the citation count during the pandemic.

METHODS

Journal Citation Reports was used to select 15 dermatology journals with the highest impact factor in 2019 and all articles published in these journals in 2020 were evaluated.² In total, 7,621 articles were identified and the AAS, which is a weighted calculation of the attention an article receives online, was recorded for each article. A total of 519 (7%) articles related to COVID-19 were identified by searching titles for "COVID", "SARS", "pandemic", "corona", "COVID-19", "2019 nCoV", "2019 novel coronavirus", or "SARS-CoV-2". The Kruskal-Wallis test was used to assess AAS and citations for COVID-19 versus non-COVID-19 related articles. For COVID-19 related articles, we also assessed whether AAS and citations varied by the type of article (editorial, original article, or guideline) and sub-specialty of dermatology to which the article pertained.³ Continuous and categorical variables were assessed using Mann-Whitney and Chi-squared tests with pre-determined level of significance $p < 0.05$.³

RESULTS

After screening, 519 (7%) COVID-19 related articles met criteria for inclusion. The *Journal of the American Academy of*

Dermatology (JAAD) published the most articles related to the COVID-19 pandemic ($n=210$, 12%; Figure 1). The *Journal of the European Academy of Dermatology and Venereology* published the highest proportion of COVID-related articles compared to all other journals (16% vs. all others %, $p < 0.001$).

A total of 40 countries were represented in COVID-19 related dermatology literature, with the most frequent being the United States (32%), Italy (17%), and Spain (12%). An average of 3.6 ± 4.5 (mean \pm SD) institutions and 6.2 ± 5.3 authors contributed to each manuscript. Sixty-five authors published more than one article, with four of those authors publishing more than five articles.

Thirty-three percent of all articles pertained to medical dermatology and 29.5% to general dermatology. Surgical dermatology comprised the least number of articles, at 1% (Figure 2). On average, articles had 768.9 words, 10.6 references, and were published 43 days after submission. Most articles were published in April (16%), May (22%), and June (17%).

The majority of articles were editorials ($n=421$, 81%), followed by original articles ($n=81$, 16%) and guidelines ($n=10$, 2%). Original articles had the highest AAS when compared to editorials and guidelines (86 vs. 23 vs. 16, $p < 0.001$). When considering the various subspecialties within dermatology, the highest mean AAS was observed for pediatric dermatology, however this was not significantly different compared to other subspecialties ($p=0.97$).

Additionally, COVID-19 related articles had a significantly higher mean AAS than articles not related to the pandemic (33

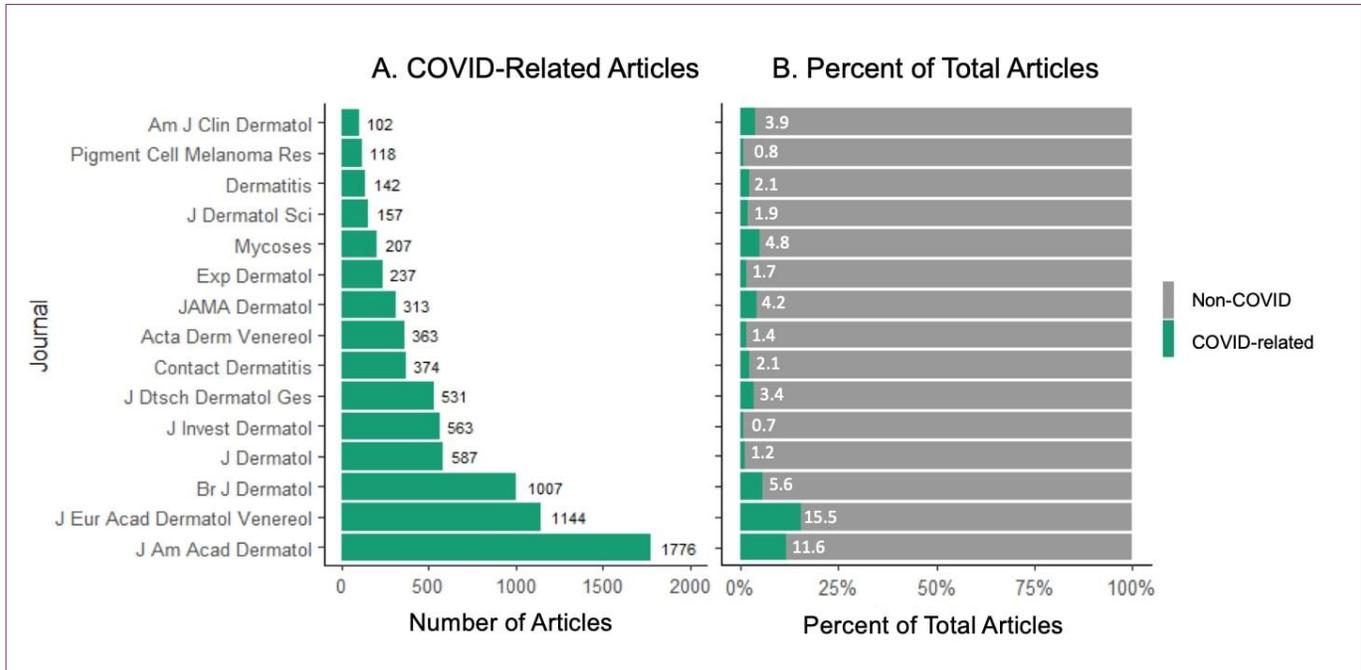


Figure 1. Number of COVID-Related articles published in the 15 dermatology journals with the highest impact factor (left) with respective percentage of total articles related to COVID-19 (right)

vs. 4 $p < 0.001$; Figure 3). While the pandemic has been a hot topic for discussion, the majority of COVID-19 related articles ($n = 144$, 28%) had an AAS of zero, indicating the articles have received no attention on online news, blogs, search engines, and/or social media.

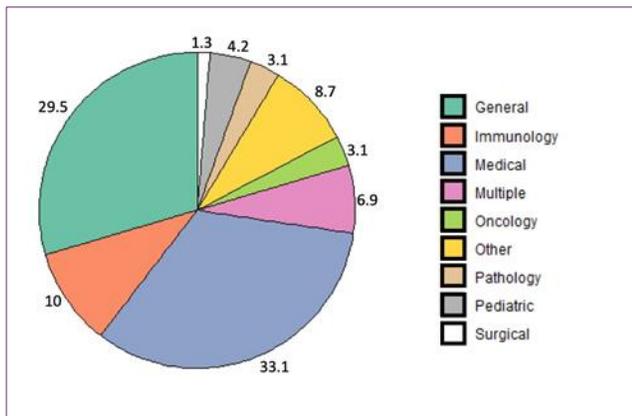


Figure 2. Categorization of COVID-Related articles within dermatologic subgroups

COVID-19 related articles accumulated 5,802 citations in total and had a higher average number of citations per article compared to non-COVID-19 related articles (11 vs. 1, $p < 0.001$). Of note, nearly a quarter of COVID-19 related articles received zero citations while five articles accounted for a large number of citations (21%). There was no association between the number of citations and sub-specialty ($p = 0.20$), or type of study conducted ($p = 0.18$).

DISCUSSION

The dermatology literature has been indelibly shaped by the COVID-19 pandemic and has captured the attention of readers across the globe. The United States, Italy, and Spain were most frequently represented in the dermatology literature, which correlates with the severity of the pandemic

in these countries in early 2020.⁴ Most articles were published in April, May, and June after the first peak of COVID-19 infection synonymous with submission during the initial wave of lockdowns in the United States and Europe.⁵

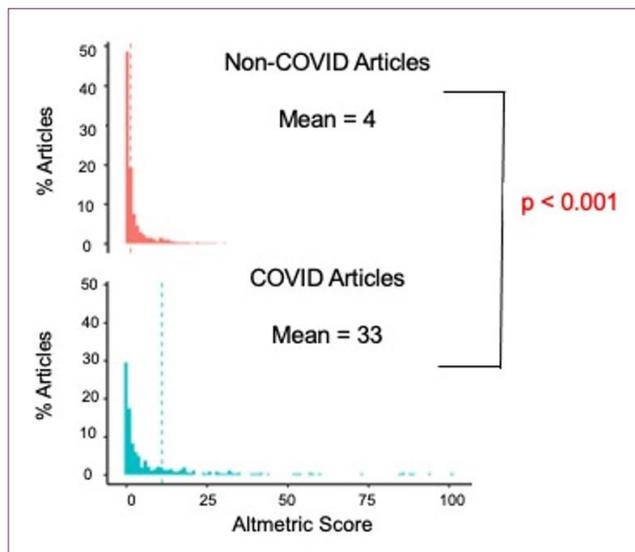


Figure 3. COVID-Related articles (mean AAS = 33) were associated with a higher AAS than non-COVID-Related articles (mean AAS = 4) ($p < 0.001$)

Journals prioritized publishing articles about COVID-19, as the time from submission to publication was shorter than what has previously been observed.⁵ Many of these articles were editorials and commentaries, reflecting the necessary dialogue required to navigate the pandemic. Further, COVID-19 related articles in dermatology literature were more widely disseminated among online news sources and social media outlets accruing more attention than non-COVID-19 articles, supporting our hypothesis that COVID-19 articles have garnered more interest during the pandemic. Thus, COVID-19 publications commanded the dermatology literature in 2020 when other research activity was paused or limited.

While the COVID-19 pandemic appears to be subsiding in the United States secondary

to widespread vaccination efforts, many areas of the world are still afflicted with high case burdens. This literature may serve of particular utility to dermatologists situated in these countries and are attempting to continually see patients despite risk of COVID-19 transmission or are caring for patients with unique dermatologic sequelae from COVID-19.

For academic dermatologists, this study suggests that research energy, time, and resources were diverted to focus on the impact of COVID-19. Given that there is a limited pool of research funding, if concern for future pandemics or outbreaks remains high and grant money is redirected towards these causes, academic dermatologists may find increasing difficulty in securing funding for supporting scholarly activity.

The increased number of editorials published during 2020 reflects the community of dermatology was effectively exchanging opinions and ideas during these unprecedented times. The significantly higher mean AAS for COVID-19 related articles compared to non-COVID-19 related articles, suggests that the public was effectively receiving updates on the novel virus' impact on the field of dermatology. Further, articles related to COVID-19 also fostered more impact as reflected by the significantly higher number of citations compared to non-COVID-19 related articles. This study is limited as we solely examined articles published from 15 journals with the highest impact factor in 2019.

This selection of journals may reduce the generalizability of these findings to the remainder of the dermatology literature. Given the timing of the analysis, it is likely that more articles will continue to be published concerning the COVID-19 pandemic and therefore this analysis only

includes a snapshot in time of the dynamic dermatology literature. Further, any issues with manual screening of data or data entry introduces the possibility of misclassification of articles or errors in determining AAS or citation count for each article. To mitigate these errors in screening and categorization, two independent reviewers collected the data and discrepancies were addressed by a third author until a consensus was achieved.

CONCLUSION

In summary, the trends discussed in this article are not surprising given how pervasive the COVID-19 pandemic has been on all aspects of medicine and are corroborated by analyses in other specialties.³ In a time of great uncertainty and upheaval, it is heartening to see how dermatologists worldwide have united to share their findings and experiences related to the global pandemic.

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