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Article

Drivers of Influence in Top Transplant Journals: Predictors of Positive Impact

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Abstract: The impact of scientific articles is often measured using metrics such as the Journal Impact Factor (JIF) and CiteScore, which rely on citation counts and publication volume. In this study, we aimed to identify the predictors of article impact in the leading solid organ transplantation journals from 2019 to 2020. Article impact was determined using its citation count in 2021 compared to the JIF. Statistical analysis was performed using IBM SPSS Statistics to identify significant predictors of positive impact on the JIF. A total of 2,461 articles and reviews were included, with variations observed among the top transplantation journals. Factors such as the number of authors, open access publishing, and authors from top affiliations were found to significantly influence the impact of articles. Articles discussing kidney transplantation and COVID-19 were associated with a positive impact on the JIF, while those discussing lung transplantation had a negative impact. The findings suggest that collaborative research with more authors and involvement of top institutions enhances impact. Open access publishing also correlated with increased citations and a positive impact on the JIF. Further research incorporating a broader range of journals and years would provide a more comprehensive understanding of factors influencing article impact.

Keywords: solid organ transplantation; impact factor; transplantation journal; open access; citation analysis; COVID-19

1. Introduction

Citations play a vital role in scientific publications by establishing durable connections to the referenced sources and attributing intellectual credit to the authors being cited [1,2]. They serve as tangible evidence of an article's reach within the scientific community, reflecting its dissemination and impact [3,4]. Furthermore, citations provide a quantitative measure of recognition, serving as a means for peers to evaluate the quality and significance of the cited work [4,5]. Consequently, being cited holds substantial value for scientists, as it serves as a motivating factor and plays a pivotal role in the assessment and evaluation of their research contributions [6].

In an effort to enhance their impact metrics, journals strive to improve their standing in the scientific community. Two widely recognized metrics, the Journal Impact Factor (JIF) developed by Clarivate®, and CiteScore developed by Elsevier®, are commonly used for this purpose [7–10]. Both metrics use similar calculation methodology, with citation on nominator and number of publications on the denominator, meaning that the more the publications or the lower the citation, the negative impact of these impact metrics. Traditionally, the impact factor (IF) of a journal has been used as an indicator of the quality of a journal and author's scientific standing [11,12]. Several factors have been found to be correlated with the JIF, these include the country's income level and the language of publishing, as well as variables such as study sample size and the publication year [13].

It is well known that articles published in top journals in each field receive higher citations, regardless of its topic [8,12,14]. However, if an article published in such journals received citations

less than the journal's impact factor, such articles will have a negative impact on its journal's impact factor, meaning that it resulted in lowering this impact metric. The aim of this study was to assess factors that predict a positive impact for articles published in top five transplantation journals in their respective journals.

2. Materials and Methods

Journal Impact Factor Calculation:

The 2021 JIF for each journal was calculated by dividing the total number of citations received in 2021 for articles published in the years 2019 and 2020 by the total number of articles published during that two-year period. All data regarding citations and publications were sourced from the esteemed Web of Science database.

Identification of Top Transplantation Journals and Contributing Institutions:

The Journal Citation Report, which is connected with the Web of Science database, was utilized for our journals selection. Five solid organ transplant journals that are ranked in the first quartile (Q1) were identified and selected from this report. According to 2021 journal citation report, top solid organ transplantation journals were Journal of Heart and Lung Transplantation; American Journal of Transplantation; Nephrology Dialysis Transplantation; Liver Transplantation and Transplantation. The Web of Science classification was also used to find leading institutions that are top contributors in the field. The list included Harvard University, UDICE French Research Universities, University of London; University of California System; Pennsylvania Commonwealth System of Higher Education; exhibited more significant contributions compared to the subsequent institutions in the ranking.

Data Collection and Retrieval:

To conduct a comprehensive analysis, we retrieved all articles and reviews published in the aforementioned top transplantation journals during the years 2019 and 2020. The data retrieval process involved accessing the Web of Science database. From the journals' respective citation reports within the Web of Science platform, we obtained the total number of citations received by each article in 2021. To enrich our dataset, we collected additional data for each article, including its publication date, number of authors, number of pages, and open access status. The affiliations of the article's authors were thoroughly analyzed, and a point was attributed if any author was affiliated with one of the top 5 institutions contributing significantly to the transplantation field.

Topic Analysis and Abstract Screening:

A meticulous topic analysis of each article was conducted based on the content of its abstract. An Excel formula was employed to extract relevant keywords related to specific transplantation topics, such as Kidney, Liver, Pancreas, Heart, and Lung. Furthermore, articles discussing the impact of COVID-19 on transplantation were meticulously assessed.

Statistical Analysis:

The statistical analysis was carried out using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, N.Y., USA). Continuous variables were described using mean (\pm standard deviation), while other nominal variables were presented as count (frequency). The relationship between different variables and their impact on JIF (positive or negative) was assessed through rigorous univariate analysis. For continuous variables, independent sample t-tests were employed, and for dichotomous variables, chi-square tests were utilized. Logistic regression models were applied to identify significant predictors for JIF impact among factors showing a significant relationship. A significance threshold of p-value < 0.05 was adopted, ensuring the statistical robustness and reliability of the findings.

3. Results

A total of 2,461 article and review were published by the top solid organ transplantation journals in the years 2019 and 2020, majority were published by American Journal of Transplantation (841, 34.2%), followed by Transplantation (633, 25.7%), Nephrology Dialysis Transplantation (472, 19.2%), Liver Transplantation (276, 11.2%), then Journal of Heart and Lung Transplantation (239, 9.7%).

Journals significantly differed in the percentage of articles that had positive impact ($p < 0.001$), with highest proportion for Transplantation (172, 27.2%), followed by Nephrology dialysis transplantation (108, 22.9%), American Journal of Transplantation (183, 21.8%), Journal of Heart and Lung Transplantation (32, 13.4%), then Liver transplantation (19, 6.9%). Figure 1

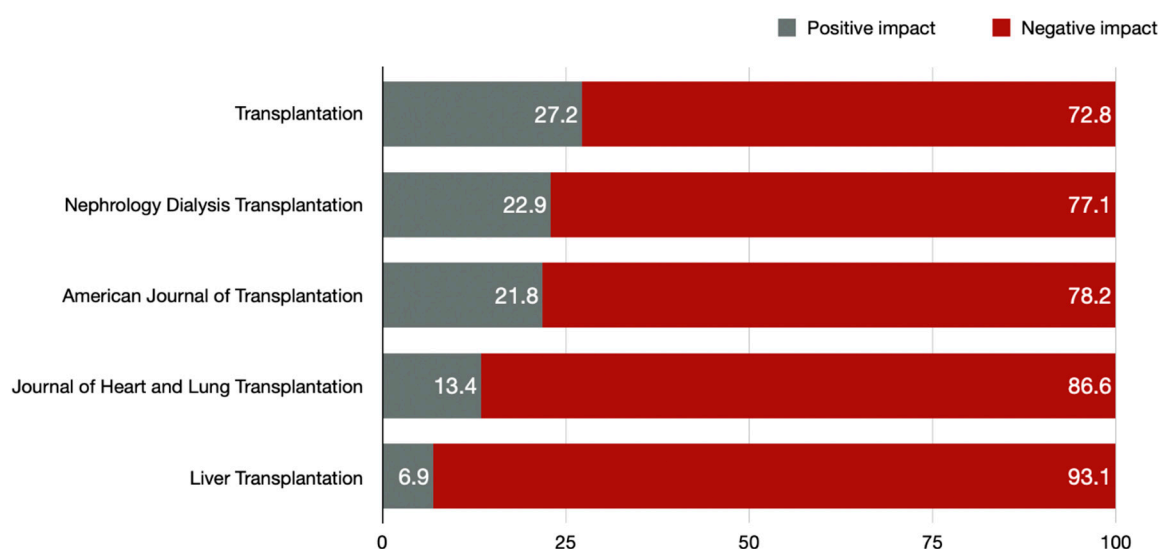


Figure 1. Distribution of articles with positive and negative impact across top transplantation journals.

We performed univariate analysis to assess factors that are related to article's positive or negative impact on JIF, Table 1.

Table 1. Univariate analysis of different variables and their relation to impact on JIF.

		Negative		Positive		p value
		Mean (\pm SD)	Count Column N %	Mean (\pm SD)	Count Column N %	
Pages		8 (\pm 3)		9 (\pm 3)		0.12
Number of authors		10.36 (\pm 10.25)		12.3 (\pm 11.46)		0.001
Year	2019		860 44.2%		242 47.1%	0.129
	2020		1087 55.8%		272 52.9%	
Open Access	No		752 38.60%		125 24.30%	<0.001
	Yes		1195 61.40%		389 75.70%	
Top Affiliation	No		1787 91.80%		459 89.30%	0.048
	Yes		160 8.20%		55 10.70%	
Kidney	No		1118 57.40%		221 43.00%	<0.001
	Yes		829 42.60%		293 57.00%	
Liver	No		1363 70.00%		366 71.20%	0.318
	Yes		584 30.00%		148 28.80%	
Pancreas	No		1885 96.80%		497 96.70%	0.49
	Yes		62 3.20%		17 3.30%	
Heart	No		1548 79.50%		431 83.90%	0.015

	Yes	399	20.50%	83	16.10%	
Lung	No	1574	80.80%	440	85.60%	0.007
	Yes	373	19.20%	74	14.40%	
COVID-19	No	1924	98.80%	436	84.80%	<0.001
	Yes	23	1.20%	78	15.20%	

Factors significant in the univariate analysis were tested in the logistic regression model Table 2.

Table 2. Regression analysis of different variables and their relation to impact on journal impact factor (JIF).

		B value	Standard error	p value	Confidence interval (CI)	95% CI	
						Lower	Upper
Step 1 ^a	Number of authors	0.013	0.005	0.006	1.013	1.004	1.023
	Open access	0.482	0.118	0.000	1.619	1.285	2.039
	Author from top affiliation	0.431	0.176	0.014	1.538	1.090	2.170
	Topic: Kidney	0.490	0.108	0.000	1.632	1.321	2.017
	Topic: Lung	-0.405	0.180	0.025	0.667	0.469	0.950
	Topic: Heart	-0.105	0.165	0.522	0.900	0.652	1.243
	Topic: COVID-19	2.674	0.251	0.000	14.498	8.865	23.711
	Constant	-2.157	0.129	0.000	0.116		

On regression analysis, the model was significant at <0.001 with predictive accuracy of 79.1%. Nagelkerke R square was 0.053. Significant predictive factors related to article characteristics include:

- Number of authors (p= 0.006), with 1.3% (0.4% to 2.3%) increase in potential impact on JIF with increasing number of authors.
- Open access (p< 0.001), with 61.9% (28.5% to 103.9%) increase in potential impact on JIF with open access publishing.
- Author from top five affiliation (p= 0.014), with 53.8% (9% to 117%) increase in potential impact on JIF when authors from top affiliations.

Moreover, several topics were significantly predictive of JIP:

- Kidney (p< 0.001), with 63.2 % (32.1% to 101.7%) increase in potential impact on JIF for kidney related topics.
- Lung (p= 0.025), with 33.3 % (5% to 53.1%) decrease in potential impact on JIF for lung related topics
- In addition, an article that discusses COVID-19 also had a positive impact:
- COVID-19 (p< 0.001), with 1,449.8 % (886.5% to 2,371.1%) increase in potential impact on JIF for COVID-19 related topics.

4. Discussion

In this study, we assessed the factors that contributed to either a positive impact (high citation counts) or a negative impact (low citation counts) of articles published in top 5 solid organs transplantation journals. The analysis revealed significant differences in the proportion of articles with a positive impact across the transplantation journals. Notably, we found that discussing COVID-19 had the most prominent positive impact. Moreover, articles discussing kidney transplantation had a positive impact, while those discussing lung transplantation had a negative impact. This discrepancy could be attributed to the substantial effect of COVID-19 on organ transplantation, with kidney transplantation being the most affected among various specialties [15]. Kidney is the first and most frequently transplanted organ [16]. Additionally, the number of end stage kidney disease patients are growing exponentially [17]. These factors contribute to the extensive discussions and

research surrounding kidney transplantation compared to topics such as liver, lung, and heart transplantation [18].

In regard to article authorship, articles with more authors or authors from top affiliations were generally more likely to have positive impact, which is consistent with previous studies that indicate a higher number of authors facilitate a wider range of expertise and a greater diversity of ideas and data types, particularly in interdisciplinary collaborations [19–21]. Additionally, our study revealed that open access articles had a higher chance of receiving citations and achieving a positive impact. This finding aligns with previous research conducted across a variety of disciplines including philosophy, political science, engineering, mathematics, physics, computer science and agriculture, which consistently demonstrated that open access publications exhibit greater research impact and citation rates compared to non-open access publications [22–25].

Despite the significant findings of this study, there are several limitations that should be acknowledged. Firstly, the study focused only on the top five transplantation journals, which may not be representative of the entire field. The findings may not be applicable to journals outside of this sample. Secondly, the study only considered articles published in 2019 and 2020, limiting the temporal scope of the analysis. Future research could incorporate a broader range of publication years to capture any potential trends or changes over time. Additionally, the study relied on citation counts as a measure of impact, which may not fully capture the influence or quality of an article. Other indicators could provide a more comprehensive assessment of impact.

5. Conclusions

This study explored the factors contributing to the impact of articles published in top transplantation journals. The findings suggest that discussing COVID-19 and kidney transplantation are associated with a positive impact, while lung transplantation has a negative impact. The substantial effect of COVID-19 on organ transplantation and the increased research focus on this topic likely contribute to these findings. Furthermore, articles with more authors or authors from top affiliations are more likely to have a positive impact, highlighting the value of collaboration and diverse expertise. Additionally, open access articles have a higher likelihood of receiving citations and achieving a positive impact.

These findings offer valuable insights into the drivers of impact in transplantation research, providing guidance for authors and journals aiming to enhance their scientific standing. Collaborative efforts with multiple authors can foster interdisciplinary perspectives and elevate the quality and impact of publications. Additionally, open access publishing can broaden the accessibility of research findings, facilitating knowledge dissemination and potentially boosting citations.

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