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LMIC authorship in global reconstructive surgery: A bibliometric analysis

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Correspondence and Communications

“LMIC authorship in global reconstructive surgery: A bibliometric analysis”



Dear Sir,

Introduction

Significant publication disparities exist between low- and middle-income countries (LMICs) and high-income countries (HICs) exist within plastic surgery literature. Among top plastic surgery journals, only 20% of articles originate from LMICs.¹ While international research collaborations may help mitigate these disparities, it is crucial that LMIC authors are fairly included in collaborative publications. This study characterizes LMIC representation in authorship as well as the extent of HIC-LMIC collaboration in the global reconstructive surgery literature. We also evaluate the relationship between LMIC authorship and article reach in the form of citations, impact factor, and open access status.

Methods

Global health articles published between January 2014 and April 2021 in plastic surgery journals were extracted from the PubMed database. We created an original Java program to extract title, year, journal, grants, type of publication, author and affiliation information, author countries and regions, and mission trip status. Other article characteristics were manually extracted. LMIC status was defined by the World Bank and determined by the first author's country of affiliation.² If authors had multiple affiliations, primary affiliation was determined through manual search of the author.

Wilcoxon rank sum tests, Kruskal-Wallis tests, and multi-variable logistic regression models were used to assess association between article characteristics and HIC vs LMIC authorship. Statistical analysis was performed in R. All tests were two-sided and $p < 0.05$ was considered statistically significant.

Results

Study characteristics

Among the 1196 articles included in our analysis, 70% of articles included at least one author from a LMIC ($n = 838$), 64% of articles listed a LMIC first author ($n = 763$), and 61% of studies listed a LMIC last author ($n = 665$). The majority (57%) of articles originated from LMICs with no HIC author listed ($n = 683$) and 30% of papers listed authors exclusively from HIC without inclusion of LMIC authors ($n = 358$). A total of 13% of articles represented collaborations between HIC and LMIC authors ($n = 158$). Notably, 50% of collaboration articles listed a LMIC first author ($n = 79$) while only 25% listed a LMIC last author ($n = 40$). Other study characteristics are given in Table 1. The highest output countries were China ($n = 260$), the U.S. ($n = 258$), Brazil ($n = 125$), Turkey ($n = 77$), and India ($n = 59$).

LMIC authorship and article impact

Compared to the overall body of global reconstructive surgery literature, articles with LMIC first authors and LMIC last authors were significantly less likely to publish in a higher impact factor journal (first: OR 0.70, 95% CI 0.61–0.80, $p < 0.001$; last: OR 0.73, 95% CI 0.64–0.84, $p < 0.001$), publish in an open access journal (first: OR 0.44, 95% CI 0.27–0.69, $p < 0.001$; last: OR 0.48, 95% CI 0.30–0.77, $p = 0.002$) or be an open access article (first: OR 0.72, 95% CI 0.55–0.95, $p = 0.019$; last: OR 0.60, 95% CI 0.46–0.80, $p < 0.001$), receive citations (first: OR 0.92, 95% CI 0.87–0.97, $p = 0.002$; last: OR 0.91, 95% CI 0.86–0.96, $p = 0.002$), or describe surgical mission trips (first: OR 0.06, 95% CI 0.02–0.15, $p < 0.001$; last: OR 0.06, 95% CI 0.02–0.15, $p < 0.001$). Notably, collaborations between HICs and LMICs eliminated these publishing disparities for LMIC authors (Table 2).

Compared to articles written exclusively by HIC authors, those written exclusively by LMIC authors are less likely to receive citations (HIC: 1.57, LMIC: 0.99, $t = -2.77$, $p = 0.006$), publish in higher impact factor (HIC: 2.01, LMIC: 1.58, $t = -6.22$, $p < 0.001$) or open access journals (OR 0.52, 95% CI 0.33–0.83, $p = 0.006$), be open access articles (OR 0.55, 95% CI 0.43–0.72, $p < 0.001$), or describe mission trips (OR 0.06, 95% CI 0.06–0.13, $p < 0.001$).

Table 1 Summary of article characteristics. Article characteristics for all global reconstructive surgery articles included in the study. 5-year journal impact factor determined from 2019 data.

Characteristic	N = 1196 ¹
Includes LMIC author(s)	838 (70%)
LMIC 1st Author	763 (64%)
LMIC Last Author	665 (61%)
5-Year Journal Impact Factor (2019)	1.35 (0.99, 2.01)
< 1	406 (34%)
1 - 2	489 (41%)
2 - 3	153 (13%)
> 3	148 (12%)
Open Access Journal	97 (8.1%)
Open Access Article	543 (45%)
Topic	
Aesthetic	66 (5.5%)
Breast	71 (5.9%)
Craniofacial	729 (61%)
General Reconstruction	100 (8.4%)
Hand	103 (8.6%)
Transgender	3 (0.3%)
Trauma/Burns	27 (2.3%)
Other	97 (8.1%)
Mission Trip	41 (3.4%)
Number of Citations Received	0.00 (0.00, 2.00)
Year	
2014	119 (9.9%)
2015	135 (11%)
2016	132 (11%)
2017	118 (9.9%)
2018	167 (14%)
2019	183 (15%)
2020	238 (20%)
2021	104 (8.7%)

¹ Median (IQR); n (%)HIC = high-income country; LMIC = low- and middle-income country; IQR = interquartile range.

to build more robust research infrastructure in lower-output LMICs. Among HIC-LMIC collaborations, only 25% had a LMIC last author, suggesting that collaborative research is largely guided by HICs and attention must be paid to ensure LMIC contributors are fairly credited.

Articles from LMICs had significantly less impact and reach. Poor research infrastructure, lack of funding, and high article processing charges contribute to these disparities.^{3,4} In LMICs where journal subscriptions may be cost-prohibitive, increasing open access publishing of local research is crucial for disseminating knowledge that improves surgical outcomes. In addition, the lack of double-blind review processes and LMIC under-representation on surgical journal editorial boards may result in exclusion of topics or authors that are highly relevant to LMICs but may not be recognized as influential by a HIC editor.⁵ HIC-LMIC collaborations appear to eliminate LMIC publishing disparities, suggesting that HIC authors may bring greater funding, resources, and academic reputations that mitigate drivers of these disparities. Thus, a multi-pronged solution to reducing publication disparities should aim to increase HIC-LMIC research collaborations, LMIC research funding and infrastructure, article processing fee waivers for LMIC researchers, LMIC representation in the editorial boards of surgical journals, and fully blinded review processes for all journals.

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Ethical approval

Not required

Declaration of Competing Interest

The authors have nothing to disclose.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.bjps.2022.11.064](https://doi.org/10.1016/j.bjps.2022.11.064).

Discussion

The majority of articles were published by exclusively LMIC teams, demonstrating that research from LMICs is being shared internationally. However, these articles originated primarily from a few high-output LMICs, indicating a need

Table 2 Characteristics of articles with LMIC 1st authors among all articles with an LMIC author and among collaborative articles.

Predictors	Includes LMIC Author(s)			Collaborations		
	Odds Ratios	95% CI	p	Odds Ratios	95% CI	p
(Intercept)	18.76	10.68 - 33.72	<0.001	1.31	0.57 - 3.04	0.522
5-Year Journal Impact Factor	0.95	0.72 - 1.30	0.743	0.94	0.63 - 1.40	0.773
Open Access Journal	0.37	0.17 - 0.85	0.015	0.35	0.11 - 1.02	0.059
Open Access Article	0.72	0.41 - 1.26	0.245	1.54	0.77 - 3.12	0.227
Number of Citations Received	0.83	0.76 - 0.92	<0.001	0.87	0.73 - 0.99	0.055
Mission Trip	0.07	0.02 - 0.26	<0.001	0.18	0.01 - 1.15	0.121

Collaborative articles are those which include both HIC and LMIC authors. HIC = high-income country; LMIC = low- and middle-income country.

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