Comparison of Research Productivity Between Metro and Non-Metro Cities in a Biomedical Journal from India

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Abstract

Background: The research productivity of a place depends on doctors, patients and available infrastructure to carry research activities. Aims: We aimed to study the publishing trends and research productivity of metro and non-metro cities in the Journal of the Association of Physicians of India (JAPI). Materials and Methods: Bibliometric analysis of research articles published in JAPI between 2000 and 2011 was undertaken. The four types of articles (original articles including brief reports, case reports, correspondence and pictorial image) were studied for research productivity. They were analyzed according to subspecialty, publication times and type of research work from both places. Comparison between groups was done using Fisher exact and Mann-Whitney U test. Descriptive statistics were used and a \( P < 0.05 \) was considered significant. Results: Of a total of 2977 articles, 1798 were available for analysis. Metros published 46\% (825/1798) and non-metros 54\% (973/1798). Original articles and case reports constituted 3/4th of the published literature from both places. Pictorial images were seen more from non-metro cities \( (P = 0.03) \). Mumbai and Delhi were leading from the metros, whereas Varanasi and Chandigarh were leading from the non-metro places. Endocrinology, Neurology, Cardiology and Infectious Diseases constituted the top four subspecialties from both places. Neurology articles were published more from non-metros \( (P = 0.03) \). The timelines from submission to publication varied between 12 and 15 months, and were lesser for articles from the metros \( (P = 0.01) \). Conclusions: Metros and non-metro cities are comparable in publishing trends and research productivity. Places with post-graduate institutes contribute majority of the research articles. Faster publication timelines from metros indicate better manuscript content and preparation.

Keywords: India, Metros, Non-metro cities, Publication trends, Research productivity

Introduction

Research activities are the essence of academic institutes and doctors involved in medical practice. The research productivity of any place or institute is determined by various factors like availability of patients, doctors keen to carry out the research and better infrastructure facilities to carry out the proposed research project.\(^{[1,2]}\) Research productivity from India is far behind when compared with the developed world based on the above factors.\(^{[3,4]}\) However, the scenario is changing now, with an increasing number of publications from the Indian subcontinent in most of the national and international journals.\(^{[5,6]}\) Academic institutes and hospitals involved in teaching and training are actively carrying out research projects at their departments. The need and importance of publishing the academic material is picking up in India for the past decade.\(^{[7]}\) Explosive growth of general medicine in the last century lead to branching of medicine into subspecialties like endocrinology, rheumatology, etc.

Metro cities are better equipped with old academic institutes and infrastructure facilities to carry out research activities at their places when compared with smaller cities and towns. On the contrary, the facilities in the government-run institutions
may lag behind the world class research facilities that exist in a
corporate lab. The research activity from the medical colleges,
post-graduate institutes and corporate hospitals finds its way
into the popular journals published from India. The Journal of
Association of Physicians of India (JAPI) is the flagship
journal of the Association of Physicians of India (API). API
was formed in 1944 and has over 15,000 participants as its
members.[9] JAPI is published every month, with a readership
of over 250,000, and is extremely popular among the medical
fraternity. The journal is published every month in print and
online, and covers all the aspects of medicine, including
subspecialty subjects. JAPI attracts manuscripts from the
length and breadth of the country and reflects the research
productivity of the physician community in India. We carried
out this work with the aim to analyze the research productivity
and publishing trends from the metro and non-metro cities in
the JAPI journal.

Materials and Methods

JAPI issues of last 12 years (Jan 2000 to Dec 2011) were
taken for analyzing the research productivity of metro and
non-metro cities in the journal. The data were derived from
the website of the journal, which gives a link to previous
issues.[9] The articles published were analyzed for types of
articles and the subspecialty or department from where the
work originated. The definition of metro is based on the total
population living in the city (more than 4 million as per Indian
census). For the purpose of this article, we considered Delhi,
Mumbai, Kolkata and Chennai as metro cities and all others
as non-metro cities.

Research work carried out by the individuals and institutions
is published as original articles. However, the same data
is published as correspondence (also known as Letters to
Editor) occasionally due to space constraints. Case reports
and reporting an interesting image are also the early steps of
research interests of individuals. Hence, the following types
of articles were included to assess the research productivity:
Original articles, Case reports, Images and Letters to Editor.
The following articles were excluded from the analysis as they
do not report data pertaining to original research: Editorials,
Update articles, Review articles, Philately, Miscellaneous
articles, Postgraduate Clinic, Guidelines, Announcements and
Corrigendum. Correspondence pertaining to the published
articles and comments unrelated to research work were also
excluded from the analysis. Articles published in special issues
and topic supplements were excluded.

The duration between initial submission and revision, time
taken for acceptance and publication is counted using the
dates given in the article files. The 1st day of every month is
taken as the date of publication of all articles given in that
issue (e.g., 1 Sep 2010 is taken as the date of publication for
the articles in the September 2010 issue). The institution of
the first author is taken as the place and department of study for the
articles involving multiple authors from different institutes and
departments. The data were obtained independently by both
the authors and discrepancy, if any, was resolved by accessing
the information jointly from the JAPI website. The details of
the study are given in a flow diagram in Figure 1. The study
data were available on the website of the journal and hence
this bibliographic analysis does not require permission of a
local ethics committee.

Statistical analysis

Summary data are presented as mean (SD) and comparison
between groups was done using the Mann-Whitney U test.
The data regarding the timelines are derived from the articles
dates given in the article files. The 1st taken for acceptance and publication is counted using the
duration between initial submission and revision, time
and topic supplements were excluded.

<table>
<thead>
<tr>
<th>Type of article</th>
<th>Metros n=825 N(%)</th>
<th>Non-metros n=973 N(%)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original articles</td>
<td>315 (38.2)*</td>
<td>329 (33.8)</td>
<td>0.05</td>
</tr>
<tr>
<td>Case reports</td>
<td>330 (40)</td>
<td>373 (38.3)</td>
<td>0.49</td>
</tr>
<tr>
<td>Correspondence</td>
<td>102 (12.4)</td>
<td>147 (15.1)</td>
<td>0.10</td>
</tr>
<tr>
<td>Pictorial images</td>
<td>78 (9.5)</td>
<td>124 (12.7)</td>
<td>0.03</td>
</tr>
</tbody>
</table>

*Mean (SD)
The division among various specialties between metro and non-metro cities is given in Table 2. Endocrinology leads the pack, followed closely by Neurology, Infectious diseases and Cardiology. Articles from Neurology and miscellaneous groups were published more from the non-metro cities. Rheumatology and Gastroenterology articles were published more from the metros in comparison with the non-metros (\(P < 0.05\)).

Details about the timelines between submission and publication are given in Table 3. The number of articles revised before publication was similar from metros and non-metros (63% (516/825) and 67% (649/973), respectively). Of the total articles sent for revision, 21% (250/1165) of the articles were rerevised. The number of articles sent for rerevision was same between both metros and non-metros (\(P = 0.88\)). The time taken from initial submission to acceptance varied between 8 and 9 months, and this was a month less in cases of articles from metro cities (\(P = 0.01\)). There was another 4 to 5 months time gap for publication after acceptance, which was not different between both the groups. The total time taken by the articles from submission to publication is about 12-15 months, and is shorter in articles from metros (\(P = 0.01\)).
Table 3: Comparison of publication timelines between cities

<table>
<thead>
<tr>
<th></th>
<th>Metros n=825</th>
<th>Non-metros n=973</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles sent for revision</td>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>516 (62.5)</td>
<td>649 (66.7)</td>
<td>0.06</td>
</tr>
<tr>
<td>Articles sent for rerevision</td>
<td>N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>109/516</td>
<td>141/649</td>
<td>0.88</td>
</tr>
<tr>
<td>Time from submission to acceptance</td>
<td>Days*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>246.3 (214.6)</td>
<td>269.3 (232.4)</td>
<td>0.01</td>
</tr>
<tr>
<td>Time from acceptance to publication</td>
<td>Days*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>133.4 (123.3)</td>
<td>145.8 (128.3)</td>
<td>0.06</td>
</tr>
<tr>
<td>Time from submission to publication</td>
<td>Days*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>379.7 (230.5)</td>
<td>414.5 (234.5)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*Mean (SD)

Discussion

Our study analyzed the research productivity and publishing trends of physicians from metro and non-metro cities in one of the most popular journals of India, i.e., the JAPI. Metro and non-metro cities contribute equally in the published research articles in the JAPI. Equal contributions from both places indicate that the physicians working in non-metro places are actively participating in research activities. The other reason could be due to the presence of post-graduate teaching institutes in places other than metro cities. The contributions in the JAPI from both the groups remained the same over the last decade. The trends remain in the same direction over the last decade, except for 2007 and 2011, in which non-metros published more articles.

Original articles are considered as the essence of research activity. This is followed by short case series and case reports. The contributions from metros and non-metros did not differ in the type of research productivity. Original articles were published more from the metros than from the non-metro cities, indicating better research output of metros. Pictorial images were published more from the non-metro cities, indicating a wide variety of cases across the country. Mumbai and Delhi contribute a greater share of articles in the metros, in tune with their status intact as the economical and political capitals of India, respectively. Varanasi and Chandigarh contributed majority of the articles from non-metro cities. This could be explained by the fact that two premier institutes imparting post-graduate medical teaching (Post Graduate Institute and Banaras Hindu University) are located in these two places.

The clinical practice of general medicine involves cardiovascular disorders, infections, diabetes and thyroid disorders commonly. The research productivity of both places also reflects a similar trend in the articles. India has the dubious distinction of being the diabetes capital of the world, and majority of the research articles pertain to the field of diabetes. The articles in the field of Neurology were published more from non-metros. The same findings were observed in a recent research paper that analyzed the publications of Indian Neurosciences. This could be due to the presence of premier neurology institutes out of metros in Bangalore, Ranchi, etc. Gastroenterology and Rheumatology articles were published more from metros probably, due to presence of active teaching departments and lack of spread of these specialties into the interiors of the country. More number of articles from non-metros was subjected for revision before acceptance. This could be explained by the fact that physicians from metros are more aware about the research activities and publishing procedures, leading to fewer revisions.

The articles take an average time of more than 1 year from the date of submission to publication. The time taken by articles from metros is less when compared with non-metro cities. The average time from submission to acceptance and publication is 1 month less for metro cities. This delay could be due to the requirement of submitting print copies of manuscript, delay in peer review process and lack of online early publication with JAPI. Online manuscript submission and prompt peer review could lead to the rapid growth of JAPI in comparison with other biomedical journals from India.

The faster timelines regarding peer review process and early publication of the accepted manuscripts are two essential requirements of a good journal. These attributes alone attract lot of good research articles from the authors. Although we analyzed all the online available data in this study, exclusion of some articles for lack of details remain a major limitation of our study.

To conclude, our analysis showed that the metros and non-metro cities were comparable in publishing trends and research productivity. Mumbai and Delhi contributed majority of articles from metros and Varanasi and Chandigarh from non-metro cities. Original articles and case reports were seen in equal numbers, whereas images were published more from non-metros. Articles from metros had faster pre-publication timelines, indicating better manuscript content and preparation.

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References

5. Poorni S, Ramachandran S, Rooban T, Kumar PM. Contributions of Indian conservative dentists and endodontists

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