Rawal Medical Journal – An Analysis of Citation Pattern

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ABSTRACT

Objective: To analyze the citation pattern adopted by the Rawal Medical Journal (RMJ) for the year 2006.

Methods: Citations of articles published in the RMJ during the year 2006 were collected and analyzed manually from the journal articles employing systematic methods.

Results: There were 437 citations in 32 research articles in two issues of volume 31 from January to December 2006. The authorship pattern of the citations indicated that more than 23% contributions were from single author and 77% were the result of team work. The ratio of the coordinated work was higher than the sole effort which was a healthy sign among researchers. The articles contributed by single author were 23.11%
and that with collaboration of five or more authors was 20.82%. Among the citations, 49.52 % pertained to journal articles. Out of the total cited articles, 23 were contributed by the Pakistani authors, 8 by foreign authors and 1 jointly by Pakistani and foreign author.

**Conclusion:** The citations from Pakistani researchers were rather low. Majority of contributions were by Pakistani authors; author and journal self citations were low indicating a high Impact factor. More research activities and better literature search are required to improve journal quality. (Rawal Med J 2008;33:254-257).

**Key Words:** Rawal Medical Journal, citation analysis, scientometrics, Medicine periodicals.

**INTRODUCTION**

Citation analysis is defined as the examination of the frequency pattern of citations in article and books.\(^1\) It uses citation in scholarly works to establish links to other works or other researchers. It is the most common method of bibliometrics,\(^2\) which is used to trace relationships amongst academic journals citations, which involves examining an item’s referring documents, is used in searching for materials and analyzing their merit. Citation analysis is used to gauge the importance of one’s work; for example, is a significant part of the tenure review process.\(^3,4\)

The Web had a huge impact on citation analysis research. Dozens of databases such as Scopus\(^5\) and Google Scholar\(^6\) have appeared which allow the citation pattern of academic papers to be studied with unprecedented speed and ease. This could
mark the end of the 40 years monopoly of citation analysis held by the
Thomas Scientific, a US based firm, formerly known as the
Institute of Scientific Information (ISI). The ISI’s citation database has
always been critized by scientists on the basis that they index a limited
number of journal titles, and cover mainly English language titles
from North America and Western Europe. Moreover, they do not cover
citations from books and most conference proceedings. However, the
myriad of web based sources now provide a much more comprehensive
coverage of the world’s literature, which helped in entering a new era of
citation analysis based on multiple sources. Furthermore, the Web has
led to several new citation measures and methods that were previously
impractical, including article download counts, link analysis, Google’s
Page Rank, Web citation and the “h-index” recently developed by the
US physicist Jorge Hirsch. Citation analysis of RMJ by adopting a bibliometric method
may provide an opportunity to the publishers, information scientists and policy makers to
determine the quality of research published in RMJ and its usefulness towards their
Organization. The objective of the study was to determine authorship pattern of citations,
publication wise distribution of citations, comparison of citations among Pakistani and
foreign authors, percentage of author self citations to total citations and percentage of
journal self citations to total citations in recently published papers in Rawal Medical
Journal (RMJ).
MATERIAL AND METHODS

The study covers 32 research articles published in the January to June and July to December 2006 issues of volume 31 of RMJ. These articles include 437 cited items, i.e. citations. It is to be noted that RMJ allows the authors to use a maximum of 40 citations for each research article. The study indicates that on average a research article included about 14 citations. The data was compiled manually from the journal articles employing systematic methods. For each citation, the following data were recorded: number of authors, type of document, origin of the document/journals, author self-citation, and journal self-citation.

RESULTS

Authorship pattern of Authorship: Out of 437 citations, the distribution of authorship of 378 is shown in Figure 1. The contribution of citations by single-author was 26.71% and 73.28% contributions were the result of team work. The contribution generated by seven or more authors was also about 15 percent.
Publication wise distribution of citations: The citation pertain to various types of publications like journal article, monographs, research reports, handbooks, encyclopedias, PhD dissertations etc. We observed that journal articles occupied the first position with a tally of 76 percent followed by monograph occupying second position accounting for about 20 percent of the citation. The citation percentage of e-journals and e-publications was low (1.83%) (Fig 2).
Comparison of citations among Pakistani and foreign authors: Out of 437 citations, 312 (71.39%) were of foreign authors. The contribution made by Pakistani authors was only 49 (11.21%). Number of foreign monograph citation were 61 (13.95%) with merely 3 (0.64%) as Pakistani (Fig 3).
Paper Contributors: Contributors to RMJ were of three types; Local (Pakistani), foreign and mixed. The total number of papers published were 32. Out of 32 research papers, 23 (71.87%) were contributed by Pakistani authors, 8 from (25.00%) by foreign authors, and 1 (2.5%) by both Pakistani and foreign authors jointly.
Author self-citation: Self-citations are often considered to be problematic. Although authors may have good reasons to cite their own work, these citations do not necessarily reflect the importance of their work or its impact on the rest of the scientific community. We found only one such citation (0.22% of total citations).

Journal self citation: Garfield has defined journal self-citation as “the common tendency for a journal to cite itself.” This concept should be distinguished from author self-citation, which is defined as an author citing another work he or she published. Only one journal self-citation was found in this study which amounts to 0.22% which is the very low as compared to other journals in the field of medicine in Pakistan. The journal
self citation (JSC)\textsuperscript{11} measures the popularity of the journal among the concerned scientific community.

**DISCUSSION**
A lot of citation analysis studies have been carried out in West and in India. In 2001, a study entitled “Indian Journal of Medical Research-An analysis of citation pattern” included 781 citations appended to 43 research articles published in Indian journal of Medical Research.\textsuperscript{12} The authorship pattern of the citations shows that more than 15% were single authored and about 85% were result of team work. Thirty-eight articles were contributed by Indian authors, 3 by foreign authors and 2 jointly by Indian and foreign authors. Of the total citations, 9.48% were author self citations and 7.3% were journal self citations. Another analysis entitled “Indian Journal of Physiology and Allied Sciences: An analysis of citation pattern”\textsuperscript{13} included 457 citations appended to 26 research articles published in the four issues in 2001. The articles were contributed by 75 authors (74 Indian). Seventy-seven percent of the work was result of team research. Of the total citation 76.81 percent related to journal articles, 18.59 to monographs, and the rest of conference papers, theses, etc. The ratio of Indian to foreign citation was found to be almost 1:6. Of the total citations, 4.59 percent are author self citations, and 2.84 percent are journal self citations. In Pakistan, we found only one study titled “Rating Pakistani Medical Journals”\textsuperscript{14} concluded, on the basis of citation pattern analysis of Journal of the Pakistan Medical Association (Centre), had the highest 5 year impact factor amongst Pakistani Medical Journals.

Citation analysis, despite its ambiguities, is an objective measure of what is variously termed productivity, significance, quality, utility, influence
effectiveness or impact of scientists and their scholarly products. Therefore, the other measures like article download count, link analysis, Google’s page rank, web citation and the h-index be considered to measure the quality of any journal. As Thomson Scientific is covering very few English language journals from the developing countries, there exist no tool to judge the quality of medical journal published from Pakistan.\textsuperscript{15}

**CONCLUSIONS**
The percentage of citations by Pakistani authors was 11.21%, which reflects the scarcity of research activities. The team work contribution was 73% which is a healthy sign and will be helpful in improving the impact factor of the journal. Average number of citation was 14, which needs improvement and requires more literature search. The author self citation and journal self citations were very low which indicates the high impact factor of the publication. The percentage of publications contributed by the Pakistani authors was 72% which is very encouraging but the joint venture ratio was just 2.5%, which needs special consideration.

However, its regularity of publication, availability in the country and abroad will be helpful in making it one of the best medical journal of Pakistan, provided it continued publishing high quality research contributed by Pakistani and foreign authors. Its free full text availability on the Internet will further improve its visibility and impact factor. To overcome deficiencies, HEC should take steps to arrange research collaboration programs of local authors with foreign authors. There is a dire need of an assessment tool in Pakistan, like
INSDOC in India, which could determine the quality of articles produced in the medical journals and their contribution to the research community.

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