Evidence Based Library and Information Practice

The Randomised Controlled Trial in Medical Research: Using Bibliometric Methods to Identify Core Journals

A review of:
Tsay, Migh-yueh, and Yen-hsu Yang. "Bibliometric Analysis of the Literature of Randomized Controlled Trials." <u>Journal of the Medical Library Association</u> 93.4 (October 2005): 450-58.

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Abstract

Objective – To explore the characteristics and distribution of randomized controlled trials (RCTs) in the medical literature. The study aims to identify the growth patterns of the RCT, key subject matter, country and language of publication, and determine a list of core journals which contain a substantial proportion of the RCT literature.

Design – Retrospective analysis of RCTs.

Setting – Medical journal literature.

Subjects – A total of 160,213 articles published between 1965-2001. Detailed analysis of a subset numbering 114,850 articles published from 1990-2001.

Methods – The study seeks to identify all RCTs in MEDLINE from 1965-2001, and examines the growth rate of the RCT. The authors then do a more detailed analysis on a subset of data from 1990-2001, using Access database and Excel spreadsheet software, and PERL programming language. The references were analyzed by five fields within MEDLINE; publication type, source, language, country of publication, and descriptor (subject index).

Main results – An exponential growth rate for the RCT is demonstrated, suggesting that in the medical literature development has not yet matured and that research using this method continues to grow. A growth rate for the RCT of 11.2% per annum is identified.

The most common form of publication is the journal article, making up approximately 98% of the RCT literature. Approximately 75% of the RCTs are multicentre trials indicating that this is the design of choice adopted by researchers.

The United States proves to be the greatest source of RCT literature, with 39.9% of journals and 50.6% of articles originating there. After the USA, the most productive countries are England (15.8% of journals and 21.7% articles) and Germany (6.5% journals and 6.1% articles). As might be expected, English is the predominant language providing 92.9% of the total publications. Of the remaining 7%, German is the most common language accounting for 2.2%.

The top three areas being researched are:

1. Drug therapy for hypertension
    2291 citations
2. Anticancer drug combinations
    2140 citations
3. Drug therapy and asthma
    1397 citations

Bradford's law of scattering is successfully applied, identifying four zones of journals which each publish approximately 26,000 articles.

Conclusion – The results indicate that bibliometric methods can be applied to the medical literature, and highlight those disciplines in which RCTs more often occur. A core list of 42 journal titles is presented, providing busy practitioners with invaluable guidance as to which journals are most likely to publish the greater number of RCTs.

Commentary

Deciding upon which journal titles to purchase is a fundamental part of library management, and anything which provides good solid evidence on which to base these

decisions is naturally very welcome. While there have been previous studies employing bibliometric methods to explore RCTs in specific areas of medicine (Curry, Reeves, and Stringer; Latronico et al.), this is believed to be the first such study to include all areas of the health sciences.

Bradford's Law of Scattering was first proposed in 1934, and for anyone a little rusty in their knowledge, the following example may serve as a refresher. If a literature search identifies 300 references, you'll likely discover that 100 of those came from a core group of 5 journals, the next 100 came from a group of 25 journals further away from the core, and the final 100 citations came from 125 journals on the outer fringes. Naturally anyone with limited time and money will focus on the core 5 titles for the greatest return on their investment. What Tsay and Yang's research does is utilize Bradford's Law to provide just such a core list for medical libraries.

The single greatest concern with this article, which appeared in the *Journal of the Medical Library Association*, is that it presents itself as covering *all* of the literature, whereas in actual fact it concentrates exclusively on the *MEDLINE* literature. This does help propagate the myth that if you can't find it on MEDLINE it doesn't exist. While the choice of MEDLINE, generally viewed as the gold standard, is understandable, this does introduce potential bias. The database is produced in North America and sometimes faces the accusation of being biased towards the US publications. Why not also search EMBASE which originates in the Netherlands and which some view as a European version of MEDLINE?

The research undoubtedly contributes towards the range of tools healthcare librarians can draw upon when making decisions about our collections. The final list of 42 core journals will not hold too many surprises for an experienced practitioner,

though interestingly, 8 of the top 20 titles identified are not included in the National Library of Medicine's list of core clinical journals.

The article could have been enhanced with more methodological detail. We are told that "each bibliographic record was downloaded and analyzed" but we are not provided with the details about what this actually involved. We do know that analysis of citations by MeSH (Medical Subject Headings, the controlled vocabulary devised by the National Library of Medicine) takes place, and that the authors used the major rather than minor descriptors to do this. However, there is no mention of how Access, Excel, and PERL programming language were used to analyze the data.

The authors have published several pieces on bibliometric analysis in recent years, including an article from 2003 with an almost identical title which appears to cover very similar ground (Tsay and Yang). Curiously this earlier publication is not referenced in the *JMLA* article, and questions about the relationship between the two remain unanswered.

An additional minor criticism would be with presentation of results, as the authors do have a tendency to move back and forth between the large data set (1960-2001) and the smaller subset of 1990-2001. The subset provides the analytical core of the article, and the reader must keep a close eye on what exactly is being reported in each table in order to avoid confusion.

While this research undoubtedly addresses a worthwhile issue and provides the ever-pressed librarian with more evidence to aid decision making, it must be said that it will be of most interest to those working in medical libraries. The final list of 42 journals is very medically orientated, and those employed in the wider healthcare arena will probably view the study as having a more limited value. Of the top 20 subjects for RCTs, virtually all of them involve some form of drug therapy. When it comes to clinical decision making, RCTs are acknowledged as one of the most effective sources of reliable information but they are certainly not the only form of worthwhile research. While the RCT is a hugely valuable research method, it is not appropriate for every form of therapeutic intervention, and is not the sole basis upon which to build a library collection.

Works Cited

Tsay, Ming-Yueh, and Yen-Hsu Yang. "A Bibliometric Study on the Literature of Randomized Controlled Trials." Journal of Information, Communication and Library Science 9.4 (June 2003): 27-51.

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