The Top-Cited Articles in Medical Education: A Bibliometric Analysis

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Tags
Clinical domain: Scholar
Educational domain: Education research

Background
First, a bit of background. Do you know the top cited paper in medicine? It is “Protein measurement with the Folin phenol reagent” published in 1951 and cited > 300 000 times. The first author stated in 1977 that it “wasn't a great paper.” Surprising isn't it. Many of the most highly cited papers are core methodology papers, cited innumerable times in subsequent research (in the methods section). The structure of DNA, the Framingham study (coronary artery disease risk factors), and retroviral therapy for HIV are not even close to making the list. It is interesting to observe that citation rates may be a blunt, imperfect surrogate for the significance of a research finding.

This KeyLIME paper adopts a similar assumption that citation rates equate with importance. Read further to discover the characteristics of these papers.

Purpose
"To identify and examine the characteristics of the 50 top-cited articles in medical education."

Type of paper
Systematic review
Key Points on the Methods

A search of Web of Knowledge was conducted from 1900 to March 2014. Google Scholar (reporting format non-restricted) and SCOPUS (not as extensive) were excluded. 13 medical education journals were searched and a keyword search of all journals in Web of Knowledge was searched.

The medical education journals were:
- Academic Medicine;
- Advances in Health Sciences Education: Theory and Practice;
- Advances in Physiology Education;
- American Journal of Pharmaceutical Education;
- Biochemistry and Molecular Biology Education;
- BMC Medical Education;
- CBE–Life Sciences Education;
- Journal of Biological Education;
- Journal of Continuing Education in the Health Professions;
- Journal of Surgical Education;
- Medical Education;
- Medical Teacher; and
- Teaching and Learning in Medicine.

Inclusion criteria were:
- Topics on medical education;
- Medical education issues related to medical students, interns, residents, or physicians; and/or
- Educational principles/theories from education or psychology that can be of value to the medical education community.

Inter-rater correlations for inclusion criteria were very high.

A correlation was calculated between number of citations and year of publication to ensure that time was not a confounding factor.

Side note: Only journals with impact factors were included. With the emergence of social media, is the print journal still the pinnacle platform for distributing research findings?

Key Outcomes

The majority of articles were published between 1979 and 2007. There was no correlation between citation rate and year of publication.

Search of Medical Education Journals
- The majority of articles were published in Academic medicine (61%) and Medical Education (29%)
- The top cited article was “Problem-based learning: A review of literature on its outcomes and implementation issues” by Albanese and Mitchell, 1993 Academic Medicine; which was cited 861 times
Search by Keywords

- 48% of articles were published in medical education journals, 34% in general medicine or surgery journals and 18% in higher education journals.
- The top cited articles was: “Evidence-based medicine: A new approach to teaching the practice of medicine” by the Evidence-Based Medicine Working Group, 1992 JAMA; which was cited 1,278 times.
- 20 of the top cited medical education articles published in non-medical education journals were among the journals top 50 most cited articles.

The majority of articles were reviews or theory-based manuscripts. Original research comprised less than 25% of manuscripts.

The topics covered included:

- Clinical competency and assessment;
- Communication skills;
- Curriculum and educational innovation;
- Faculty development;
- Medical experts and performance
- Medical simulation and standardized patients;
- Problem-based learning; and
- Professionalism and professional competence/practice.

Epstein, Harden, Hafferty, Irby, Norman, Papadakis, Schmidt, and van der Vleuten were the most frequently cited authors. First author affiliations were mainly from the United States, Canada, the Netherlands and the United Kingdom.

Key Conclusions

The authors conclude "This bibliometric study identified the most frequently cited medical education papers published in medical education journals and across all journals listed in the Web of Knowledge. The results show the impact that the articles have had on the scientific community and the field of medical education.”