ORIGINAL ARTICLE

An evaluation of emergency medicine investigators' views on open access to medical literature

R M Rodriguez, J Wong, J Hardy, E Frankel

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See end of article for authors' affiliations

Correspondence to:
R M Rodriguez,
Department of Emergency
Services, San Francisco
General Hospital, 1001
Potrero Ave, San
Francisco, CA 94110,
USA;
rrodriguez@sfgghed.ucsf.
edu

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Background: Scientists and governmental agencies have called for free universal access to research publications via the internet—open access.

Objectives: To examine the current medical literature reading practices of emergency medicine investigators (EMIs) and their views towards open access.

Methods: Surveys were mailed to the 212 corresponding authors of all original research articles published in years 2002 and 2003 in the *Annals of Emergency Medicine*, *Academic Emergency Medicine* and *The Journal of Emergency Medicine*.

Results: The most commonly read forms of medical literature reported by the 129 (61%) EMI respondents were hard-copy medical journals and online literature review services. 59% of EMIs were in favour of open access; 58% stated they would read a wider variety of medical literature; 21% believed open access would improve the quality of publications and 39% thought it would decrease the quality. When asked how a US\$1500 fee for open access would affect their ability to publish research, 69% said it would greatly impede and 19% said it would slightly impede their research.

Conclusions: Despite concerns that open access may impede their ability to publish research and decrease the quality of publications, most EMIs surveyed favoured open access. They believed open access would increase and broaden their medical literature reading.

Although news organisations, including print and television media, have adopted and promoted free internet versions of their reports, medical and scientific journals have lagged in this endeavour. Most major newspapers can be read free online, but medical journals generally require individual or institutional paid subscriptions for internet access. The price of these subscriptions has risen at a rate far outpacing inflation.¹

Under the current profit-driven fee for access system, the financial burden of medical journal publication is placed on readers via subscription fees or dues to medical organisations and societies. In contrast, in one open access publication model, investigators pay a fee—typically ranging from US\$500–2500—for review and publication of their manuscripts; readers access research articles freely on internet websites.² Funds from private foundations or federal grants defray other costs of editing and publication.

Scientists and researchers across the globe have issued calls for open access. The Open Society Institute released the Budapest Open Access Initiative in February 2002, calling for research to be freely accessible through online archives and open access journals.³ In 2003, (1) the Bethesda Statement on Open Access Publishing was released, providing a two-part definition of open access publication and outlining steps to increase open access to research;⁴ (2) using an in-depth economic analysis, the Wellcome Trust published a paper supporting open access;⁵ and (3) The Max Planck Society delivered the Berlin Declaration on Open Access to Knowledge in the Sciences and the Humanities, which laid out both a definition of open access publication and a commitment to making it a reality.⁶ In 2004, 25 Nobel laureates expressed their support for open access of National Institutes of Health (NIH)-funded research in a letter to the US Congress.⁷

American and international governmental organisations have responded to these appeals for open access, at least with regard to publicly funded research. In July 2004, the US

House Appropriations Committee recommended that research funded by the NIH be made freely available from the internet site PubMed.⁸ The NIH responded with a formal policy requesting that authors submit copies of their manuscripts to PubMed Central within a year of publication.^{9–10} In the UK, the House of Commons Science and Technology Committee likewise recommended that government funding agencies put an open-access condition on research grants, thereby requiring grantees to deposit full-text manuscripts of funded research in open-access repositories.¹¹ The current primary open-access repositories and publishers are PubMed Central (<http://www.pubmedcentral.gov/index.html>), BioMed Central (<http://www.biomedcentral.com/info/>) and the Public Library of Science (<http://www.plos.org/>).

Most published research, especially in emergency medicine, is not, however, freely available under open access. Thus, the objectives of this descriptive study were: (1) to define the current medical literature reading practices of emergency medicine investigators (EMIs), with special emphasis on obstacles to reading and accessing literature; and (2) to explore attitudes of EMIs regarding a model of open access, including its potential effects on research quality and ability of investigators to publish their work.

MATERIALS AND METHODS

After the institutional review board approved the study, we mailed a survey to the corresponding authors of all original research articles published in the years 2002–3 in the following emergency medicine journals: *Annals of Emergency Medicine*, *Academic Emergency Medicine* and *The Journal of Emergency Medicine* (chosen by consensus as the emergency medicine journals that we most often read). Original research articles were defined according to the standards used by each of the journals. RMR and EF had 100% agreement on articles meeting this definition. Qualifying articles were retrieved

Abbreviation: EMI, emergency medicine investigator

Figure 1 Barriers to reading the medical literature. Scale from 1 (not at all important) to 5 (extremely important).

from all 2002 and 2003 issues of these journals. The corresponding author for each article was identified using the “Corresponding author”, “Reprint address” or “Address for Correspondence” designations on the title pages.

A single mailing was made in February 2004; each envelope included a stamped return envelope, US\$1, the survey and the following description of open access:

Several groups of scientists and physicians have proposed that all scientific and medical research publications should be made available free of charge over the Internet. Under this model of *open-access* publications, the administrative costs of publication would be transferred from journal subscribers to investigators, who would have to pay a fee (typically [US]\$1500 per manuscript) for publication.

In addition to demographic queries, the 11-question survey included Likert scale and Likert-type scale questions, which were pilot tested on a group at the Department of Emergency Medicine, Alameda County Medical Center, Oakland, California, USA, regarding medical literature and opinions about an open-access model. Missing responses to individual questions (<1% of the overall total) were excluded from calculations. Data were entered using double data entry into Microsoft Excel V.2000 for data management and calculation of descriptive statistics.

RESULTS

We received 129 (61%) completed surveys. Of the respondents, 99 (77%) were men and their mean age was 40.6 (standard deviation (SD) 6.7) years. In all, 110 (85%) respondents described themselves as full-time academic, 13 (10%) as part-time academic, 3 (2%) as non-academic and 4 (3%) as residents; 111 (86%) of them had published ≥ 4 peer-reviewed manuscripts in the preceding 5 years.

The most commonly read forms of medical literature were hard copies of personal subscriptions to journals and online literature review services—for example, UpToDate (table 1). The most commonly cited obstacles to reading medical literature were lack of time and subscription costs (fig 1).

Figures 2–4 summarise attitudes towards open access. When asked about the US\$1500 fee for posting their work for open access, 69% of the EMIs said that the fee would greatly impede and 19% said that the fee would slightly impede their ability to conduct and publish research.

DISCUSSION

The internet’s effect on the spread of knowledge is staggering—not since the invention of the printing press has a technological development similarly advanced the diffusion of information. Anyone with internet access can easily find out hourly Australian election results or can read the daily

Table 1 Percentage of respondents (n = 129) reporting utilisation of sources of medical literature

Source	Never	Sometimes	Frequently
Personal hard copies of journals	4	25	71
Journal hard copies in libraries	11	52	37
Personal subscriptions to internet journals	19	30	50
Internet journals accessed through libraries	10	28	62
Free internet journals	9	47	43
Internet medical literature summaries (UpToDate or similar services)	3	35	62

box scores in Japanese baseball leagues. The fact that doctors and scientists across the globe cannot similarly access new developments in medical research is, in our view, lamentable.

In our examination of attitudes towards open access, we found that most of the EMIs surveyed were in favour of open access. If medical literature was freely available in an open-access model, 58% of EMIs reported that they would read a wider variety of journals and 49% believed that they would read more overall medical literature. Most investigators believed that a US\$1500 open-access publication fee would greatly hinder their ability to publish research.

Regarding the most important obstacles to reading the medical literature, open access would possibly decrease the effect of the subscription cost barrier. By reducing the time necessary to search for and retrieve relevant articles, open access may also increase academicians’ time to read.

The reasons why 39% of respondents believed that open access would decrease research and publication quality are

Figure 2 Medical professionals should have free open access to medical literature.

Figure 3 With open access I would read a greater variety of medical literature.

unclear. Possibly, investigators, who are possibly familiar with the extensive journal review, editing and revision process, believe that some of these checks and balances may be discarded in an internet-based system. Investigators might also surmise that an “open access’s fee to publish model” may ultimately lead to a “pay for play” system, in which studies funded by private industry buy their way into journals. Similarly, the fee for open-access publication may further promote the bias against the publication of studies with negative outcomes. Industry sponsors of research might simply refuse to pay fees to publish articles stating that their device or drug offers no benefit, and investigators might be averse to using their scarce funds to publish such manuscripts.

Surveying authors of research papers submitted to three journals, Schroter and Jite¹² reported that investigators had limited familiarity with open access; two thirds of respondents stated that they preferred to submit to non-open-access journals and only 10% had submitted to an open-access journal. In another study consisting of semistructured telephone interviews of 28 international authors, Schroter *et al*¹³ stated that nearly all authors were in favour of open access, but had concerns about author charges for publication, especially with regard to limits imposed on investigators from developing countries and on those without outside funding.

At first glance, the topic of open access pits the money-making endeavours of journal publishing companies and medical societies against the free dissemination of knowledge and access to research. However, these interests may not be mutually exclusive. A variety of revenue-generating and cost-sharing proposals could be enacted to sustain both open-access and traditional printed journals. An annual fee could be established for physicians, giving them universal online access to medical journals. Board recertification could be connected to reading of online open-access articles similar to the recertification process enacted by the American Board of Emergency Medicine. Furthermore, coordination between the open-access system and journal publishers could lead to a more efficient and timely review, editing and publication process.

In a study on the financial feasibility of open access, the Wellcome Trust reported that “author pays” models are feasible.² They estimated that in the current “subscriber pays” model, the cost to publish an article in a journal of good to high quality is US\$2750; in the “author pays” model it would be US\$1950.²

LIMITATIONS AND FUTURE QUESTIONS

The major limitation of our study is the limited response rate. To maximise our response rate, we included a small monetary incentive along with a stamped, addressed return envelope. We

Figure 4 Open access affect the quality of medical literature.

also truncated our survey according to published recommendations.¹⁴ We did not, however, re-mail the survey to non-responders. We were unable to determine whether responders differed from non-responders in any meaningful way.

We minimised bias by presenting a neutral introductory statement about open access and by providing positive, neutral and negative response choices to all questions. Merely raising the issue of open access, however, could have influenced their responses via a Hawthorne Effect—a change in behaviour of study subjects when they know they are being studied. Similarly, social desirability response bias and acquiescence response bias (the tendency to agree rather than disagree) may have influenced the responders to answer in favour of open access.

Regarding application to other medical groups, the views of EMIs may not reflect those of physicians in other specialties. Other questions that need to be explored include the following:

1. What fee, if any, would be acceptable to investigators for open-access publication of research?
2. Would doctors pay fees providing them unlimited access to all major journals over the internet?
3. How often do individual subscribers save hard-copy journals—that is, is there a collector’s motivation for hard-copy journals?
4. How often is journal subscription the prime motivation for joining medical societies?

CONCLUSIONS

Despite concerns that open access may impede their ability to publish research and decrease the quality of publications, most respondent EMIs favoured open access and believed that it would increase and broaden their reading of the medical literature.

Authors’ affiliations

R M Rodriguez, Department of Emergency Services, San Francisco General Hospital, San Francisco, California, USA

J Wong, J Hardy, Department of Emergency Medicine, Alameda County Medical Center, Oakland, California, USA

E Frankel, University of California San Francisco School of Medicine, San Francisco, California, USA

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