

## Further developing the profession's research mentality

DOI: 10.3163/1536-5050.96.4.003

One of the most enjoyable and thought-provoking parts of being a coeditor of the *Journal of the Medical Library Association (JMLA)* has been working with authors while editing their research manuscripts. The process of providing critiques and suggestions to further strengthen the papers that are entering the profession's evidence base has been tremendously engaging, and the authors have often expressed great appreciation for the collaborative nature of the editorial process.

This month's editors' column notes a gratifying and exciting increase in the number of research papers published in the *JMLA* across the tenure of the last several editors [1]. This emphasis on research is also echoed in the recently updated research policy statement of the Medical Library Association, which notes, "information issues have moved to a prominent position on the health care research agenda, and health sciences librarians are well placed to investigate many of them" [2]. In light of the consistently developing focus on research in health sciences librarianship, I am taking this opportunity, as our team concludes its editorial term, to share a few observations and ideas gleaned from our work with the *JMLA* and its authors over the last three years, with the hope of fostering continued discussion and the growth of the profession's research mentality.

### Prerequisites to research

While it may be unrealistic to expect that all health sciences librarians will be involved in designing and executing research initiatives, given the rich variability in our roles and personal interests, I would argue that continuing our exposure to research topics serves as an excellent professional development outlet. Myriad opportunities to learn more about biomedical research are available—ranging from online tutorials, to continuing education sessions at

professional meetings, to formal coursework in health sciences education programs—and cover a wide swath of topics. Feedback from current and past members also indicates that serving on the *JMLA* Editorial Board provides an excellent opportunity to develop one's knowledge of and ability to critique and refine research in our field.

Developing a better understanding of research issues can only increase our skills in searching and filtering the biomedical literature. The "JMLA Case Studies" series has been intended to illustrate the utility and approachability of this kind of professional growth. Increasing our knowledge of research further develops our skills in a number of important areas, including:

- identifying and classifying study design and relative merit of various approaches
- understanding terminology that we can use to refine our searches
- discerning connections between topics and identifying potentially relevant background literature with more confidence
- facilitating further and deeper relationships with the literature and with our users
- adopting a more systematic approach to planning and undertaking projects with a critical eye to assess the potential utility of various approaches

This knowledge also serves as a necessary foundation for undertaking a research project by informing the researcher's selection of the approach most suited to the research question under consideration. Understanding the relative applicability and merit of various design approaches provides a researcher with the confidence to weigh design options and pursue the path most likely to lead to a valid answer to a given research challenge.

### Identification of areas for research

Research techniques provide a powerful way to further understand the

merit and contribution of our efforts as health sciences librarians. It behooves us to periodically scrutinize our libraries' efforts and decisions with a healthy dose of skepticism and consider sometimes uncomfortable questions such as: Are we doing the right things? Is there room for improvement in what we do and how we do it? Are we missing any opportunities to enrich our collaboration with our institutions and user base? Discrete research projects can provide invaluable data to inform decisions about allocating our human and monetary resources.

The health sciences library environment is rife with areas for evaluation and other research efforts. Potential areas for investigation may include:

- user perceptions of and participation in open access publishing
- questionnaire and observation data gathered to understand the impact of service changes (e.g., transitioning to a pay-for-printing model at computers in the library, altering library hours or access policies)
- user satisfaction with search and filtering services for clinicians, consumers, or other constituents
- information needs assessment of hospital committees
- electronic resource access trends
- retention of information skills training
- usability testing of library-developed electronic tools (e.g., resource portals, tutorials)

### Approach to research

As we think about potential areas for research, it is also essential to thoroughly examine existing evidence and objectively contemplate how our research can contribute new and unique information to the knowledgebase of the profession. As the scope and depth of our practices as health sciences librarians continue to expand, it also becomes increasingly essential to draw on related work from other fields. Complementary theories

and approaches may be drawn from diverse fields including sociology, education, psychology, informatics, anthropology, medicine, and so on.

Our profession has a growing armamentarium of existing techniques for approaching research. Commonly used techniques include:

- questionnaires
- interviews
- analysis of existing data (e.g., usage statistics)
- experimental testing (e.g., usability studies)
- bibliometrics
- pre- and posttest designs

Randomized trials and systematic reviews have also appeared to a limited extent in the field and are important strategies for evaluating library programs and services. Exploring approaches beyond those typically employed in the field is also a worthwhile endeavor for interested researchers.

The current issue of the *JMLA* includes an example of one such exploration [3]: Hendrix uses factor analysis to examine relationships among variables such as publication patterns, faculty size, and research productivity using a technique called factor analysis, a method from the field of behavioral sciences that explores relationships between variables, focusing on quantitative analysis and qualitative inferences about variable groupings within a given dataset [4,5]. This technique can also be very useful for analyzing questionnaire data, to see how participants' responses cluster and to further understand themes within the data.

As part of a systematic approach to research planning, it is also essential to determine a priori which statistical techniques are most suited to analyzing the data we plan to collect. Descriptive techniques, such as mean values and ranges, are always valid and useful ways to summarize data and can yield valuable representations of areas of consistency and variation within a dataset. Techniques employing hypothesis testing (e.g.,  $\chi^2$  test) may also provide powerful

tools for further exploring potential associations in our datasets but are not without potential pitfalls. Establishing a statistical plan before executing the research also protects a project from the temptation of "data fishing," in other words, running multiple analyses until you arrive at the answer you were hoping for [6].

Though statistical software packages such as Stata and SPSS make statistical analyses increasingly accessible, the misleading ease of analysis can also make it easy to execute techniques that are not valid for a given dataset or analysis. Research investigations in the literature often examine relatively small sample sizes, precluding the use of traditional parametric statistics (e.g., Student's t-test,  $\chi^2$  test); however, the more conservative nonparametric approaches (e.g., Fisher's exact test, Wilcoxon rank-sum test), which do not require making any assumptions about the distribution of the data (e.g., that the data fall into a typical, "normal" distribution like a Bell curve), provide valid hypothesis-testing options often more suited to the types of data explored in the health sciences library literature [7]. Such decisions may be informed by an individual researcher's own knowledge of statistics, and consulting with a biostatistician at the outset of a project can also save considerable time and frustration in teasing out the nuances of potential statistical approaches.

### Conclusions

Increasing our knowledge of issues related to research design and execution makes us better consumers and producers of research. Research techniques present valuable opportunities for qualitatively and quantitatively demonstrating the contributions and value of health sciences librarians and libraries. Continuing to extend our professional development in this area will aid us in identifying ways to continue our growth, extending our ability to collaborate with others at our institutions, and contributing to the milieu of the

basic sciences, clinical research, and practice of medicine. As we move forward in this area, we must challenge ourselves and our colleagues to embed a research mentality in the way we approach searches and plan for allocation of our finite and valuable resources. It will be exciting to see how the ongoing development of the profession plays out in our research-related work, and I look forward to seeing how the research approaches in our field continue to evolve in breadth and complexity.

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