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Assessing the National Library of Medicine's Informationist Awards

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Abstract

Objective: To understand the experience of the informationist recipients of NLM-funded Administrative Supplements for Informationist Services and gather evidence for their impact on NIH-funded biomedical research

Methods: A mixed methods approach consisting of a survey of principal investigators and a focus group of informationists.

Results: Informationists appeared to have a positive impact on their team's research, especially in the areas of data storage, data management planning, data organization, and literature searching. In addition, many informationists felt that their involvement had increased their research skills and made them true research partners. Assessing their own impact was a challenge for the award recipients, and questions remain about the best evaluation methods. The overall experience of the informationists and researchers was mixed but largely positive.

Conclusion: The NLM-funded informationist supplement award appears to be a successful mechanism for immersing informationists into research teams and improving data management in the supported projects.

Introduction

The term informationist was first proposed in a 2000 article by Davidoff and Florance in the *Annals of Internal Medicine* (Davidoff and Florance 2000). Building on the model of the clinical librarian, Davidoff and Florance saw the informationist as an information professional with solid training in both information science and a biomedical area who would function as a member of research or care teams in health settings. The initial response from the library community was mixed, with some librarians celebrating the new concept and others feeling that it was a role already being played by clinical librarians (Kronenfeld 2000). Since 2000, informationist programs have appeared in several medical libraries, including those at Vanderbilt University and Johns Hopkins University, as well as the National Institutes of Health Library. The concept has also expanded beyond the clinical sphere to encompass basic research and public health, resulting in new titles like research informationist and public health informationist.

The National Library of Medicine (NLM) has been involved in the informationist field from the very beginning. In 2002, two years after the Davidoff and Florance article was published, NLM held a joint conference with the Medical Library Association to establish a clear definition of the position and create a list of attributes and skills necessary (Shipman et al. 2002). Following the success of the conference and realizing that librarians might require additional training, NLM created a fellowship training program that ran between 2003 and 2008 in which nine fellows were selected and pursued internships and coursework to support their enhanced role as informationists (Florance 2013). In 2010, NLM launched the newest phase of informationist support, the NLM Administrative Supplement for Informationist Services in NIH-Funded Research Projects. The supplement allows researchers with active NIH grants to apply for additional funding to add an informationist to their team in order to enhance one or more aspects of research data management. The goals of this program are to "improve the capture, storage, organization, management, integration, presentation and dissemination of biomedical research data" and to assess the value and impact of the informationist's contribution to the research team (Services. 2014). Eight two-year supplement awards were made in 2012, 11 awards were made in 2014, and 11 awards were made in 2015. To date informationists have worked on a variety of research data management tasks with both basic and clinical science teams. Example tasks include designing a database for clinical trial data, organizing and curating proteomic data, and building a data dictionary to facilitate the discovery of dementia screening research.

To inform planning for future funding of this program, NLM was interested in understanding the program outcomes to date. The goals of this project were therefore to understand the experience of the informationists, learn what methods they had used to evaluate their impact, and gather evidence for their contribution to biomedical research.

Methods

We used a mixed methods approach consisting of a survey of principal investigators (PIs) of the 2012 projects and a focus group of informationists on the 2012 and 2014 projects.

PI Survey

We created a survey to distribute to the PIs of the award-funded research teams to determine

whether the informationists had been successful in enhancing biomedical research. As the projects funded in 2014 were still ongoing (and the 2015 awards had not yet been announced), we decided to contact only the eight PIs who had received informationist awards in 2012, as they would be in the best position to reflect upon the experience. The survey questions focused on the impact of the informationist on the team's research, particularly the data management areas outlined in the funding announcement (e.g., data capture, data storage, data organization). We also asked about the informationist's impact on other information management areas such as literature searching, indexing and classification, and performing systematic reviews (Appendix 1). Additional survey questions asked about the informationist's contribution to the research process and the most useful tasks the informationist performed for the team. Finally, to prompt the PIs to reflect on the overall experience, we asked them whether they would add informationists to future projects. We created the survey in Survey Monkey® and emailed an invitation and link to the eight PIs designated in the award applications. After the surveys were completed, we compiled descriptive statistics for analysis.

Informationist Focus Group

We held a focus group of informationists at the 2015 Medical Library Association Conference. The insight of the informationists was crucial in our understanding of the program, as they could share their contribution to their team's research, explain their efforts to evaluate their own impact, and share their overall experience. Using the contact information listed on the initial award applications, we sent out emails inviting all the informationists from the 2012 and 2014 rounds of the award to participate in a 45-minute focus group at the conference. We encouraged recipients to forward the invitation to other NLM-funded informationists, as we knew there had been some personnel changes since the initial applications.

The focus group questions addressed three areas: research impact, self-evaluation, and overall experience (Appendix 2). Although not every question was specifically asked during the session, the key topics were discussed. The research impact questions focused on whether the informationist's work had improved data practices or added value to the team as well as whether the informationists had continued working with their research team once the award funding ran out. The evaluation questions centered on the evaluation methods the informationists had used to assess their role's value and impact. The final questions asked about the informationist's overall experience of the award, including what had and had not gone well, what they wish they had known before starting the project, and whether they would participate in another research project. As the focus group participants were in different stages of their projects, we designed the questions so they could be answered retrospectively or prospectively.

We recorded and transcribed the focus group discussion to ensure accurate data. We systematically coded the data by reading through the transcript to identify themes and then created categories for data coding. We then applied the codes to the transcript in an iterative process. Finally, we grouped the data into codes and summarized the data using an axial coding process (Krueger 1994).

Results

PI Survey

Six of the eight PIs completed the survey (75% response rate). Of these six PIs, three responded that they worked with the informationist on a quarterly basis, and three said that they worked with the informationist on a monthly basis. When asked about the overall impact of the informationist on their research, four PIs said the informationist had "some impact", and two said the informationist had a "large impact." In response to whether the informationist changed how the team conducted research, five PIs responded "yes", and one responded "no". The question of whether working with an informationist contributed to making progress toward research project outcomes produced similar results, with five PIs responding "yes" and one responding "no".

Of the research data management areas listed in the survey, the PIs reported that the informationists had the most impact on data storage/archiving, data management planning, data organization, and data capture. They reported that informationists had little or no impact on data dissemination/sharing, database training, data visualization/presentation, and data integration, indicating activities that may not have been relevant to the specific projects (Table 1). When asked about more general library skills, the PIs selected literature searching as the area of most impact. The remaining categories (i.e., critical appraisal, systematic reviews, indexing and classification, information visualization and presentation, and measuring impact of research/bibliometrics) were seen as less impactful and may also have been outside the scope of the particular projects (Table 2). When PIs were asked to share what they believed to be the informationist's most useful contribution, responses included convincing the PIs to use online centralized file storage, assuring collaborators that the data were stored securely, identifying citations relevant to data, identifying appropriate sources of information, and developing a data model.

Table 1: Research Data Management Areas of Impact.

Research Data Management Areas	Large Impact	Some Impact	No Impact/did not work on this
Data storage/archiving	3	3	0
Data management planning	3	2	1
Data organization	3	2	1
Data capture	2	3	1
Data dissemination/sharing	2	1	3
Database training	2	1	3
Data visualization/presentation	2	0	4
Data integration	1	3	2

Table 2: Literature Areas of Impact.

Literature Areas	Large Impact	Some Impact	No Impact/did not work on this
Literature searching	**4**	1	1
Indexing and classification	2	1	**3**
Systematic reviews	2	1	**3**
Critical appraisal	2	0	**4**
Information visualization and presentation	1	1	**4**
Measuring impact of research/bibliometrics	1	0	**5**

Although none of the PIs reported adding an informationist to other research projects, one said that the informationist was still working on their research team. When asked if they would add informationists to future projects, all PIs responded in the affirmative, although they noted additional funding, time, and/or training for informationists as necessary pre-conditions (Table 3). Finally, when asked what they would have done differently, PIs mentioned wanting someone with more programming skills, database training, and more knowledge of the NIH research process.

Table 3: Additional Needs.

Would You Add Informationists To Other Research Projects?	# Responded
Yes	
I already have	0
If there was additional funding	3
Depending on the research needs of the grant	3
If the informationist had more training in my discipline	1
If the informationist had more data management training	1
If the informationist could dedicate more time to my project	1
No	
library services are sufficient	0
Informationist services were not necessary for my research projects	0
My data management needs are met by other units at my institution	0

Informationist Focus Group

Thirteen out of 31 informationists attended the session: four from the 2012 award, eight from the 2014 award, and one from both 2012 and 2014 awards. In total, they represented eight institutions (of the possible 12).

The informationists were asked to talk about the ways they believed they had improved the research process. They predominately mentioned organizing data and increasing researcher awareness of librarian search skills and available library services. In addition, one informationist mentioned that their team was so impressed with the systematic review they performed as part of the award that the PI recommended that systematic review training be integrated into their department's curriculum.

Although not specifically asked about in the focus group, one theme that emerged was many informationists felt they had really benefited from the increased research exposure that went along with being embedded in a biomedical research team. As one informationist put it, "any librarian who hasn't had a lot of research or a lot of time with a research team, having this supplement allows them to become in-depth partners in research."

The informationist award required that recipients evaluate the impact and value of their contribution but gave no specific guidance for doing so. The focus group discussion revealed that this self-evaluation was a challenge for many informationists. Although all of them submitted an assessment plan as part of their application, only one or two had been able to implement their plan or were on track to implementing it. Because the specific activities of informationists varied across the funded projects, the proposed evaluation plans used a variety of methods, including focus groups with the research teams, a logic model to measure inputs and outputs, workflow data analysis, interviews, and surveys. However, one of the major impediments to evaluation was developing an evaluation method that would actually measure an informationist's value. As one informationist said, "how can you know what effect your service had if you are not able to compare how their grant would have gone without the service?" Another challenge was the difficulty of integrating the required evaluation into the workflow of the project. One participant mentioned that they would have liked to do an evaluation a year or two down the road, as they could not implement something and then immediately ask how it was working. Another informationist shared that her research team did not like the focus on evaluation and wanted her to focus solely on the research project outcomes instead.

The overall experience of the informationists was very mixed. In addition to the challenges of integrating evaluation of their impact and value, many faced challenges related to differing expectations of their research team and personnel changes in the middle of the funded time period. Some projects stalled or did not get off the ground, either because crucial equipment broke or because of unforeseen delays in data collection. Several informationists mentioned challenges related to communication with their sponsored programs offices or PIs. More than one informationist mentioned that their team had not been notified that they had received the award or that they had gotten it quite late, which meant reorganizing schedules and research plans. Difficulties with PIs were mostly due to lack of communication, as one informationist said, "it would take many months to get a meeting and then [it] would be canceled..."

In order to overcome these challenges, many informationists identified strategies that they felt had helped them succeed. These included setting clear expectations, potentially working with investigators who were in the early stages of their research career, working in a team of informationists, and frequent communication with other members of the research team. Because lack of communication was a major stumbling block, several informationists mentioned the necessity of participating in team meetings, which were often the way that informationists were made aware of data management issues or potential needs. As one informationist put it, "attending the lab meeting is the best way to immediately take care of their information needs."

One unexpected finding that emerged during the focus group was that some of the informationists struggled with the fact that a portion of their time was now dedicated solely to one group of researchers rather than the entire campus. Not only did this restrict the amount of other projects they could participate in, but they also felt they were restricting their services only to teams that could pay, something that was contrary to the service ideals of libraries and librarians. This idea was countered by those who felt they would be able to parlay their new skills into research services for the entire university community.

Discussion

The results of our evaluation of the NLM administrative supplement awards suggest that informationists are able to contribute to biomedical research by improving data management practices.

The main goal of the NLM administrative supplement award is to enhance biomedical research through the integration of an informationist focused on data management. The results of the survey and focus group show that informationists can make many contributions to this area. According to the PIs, informationists had a positive impact on their research process and helped them make progress toward their research goals. When considering the data management issues that were the focus of the award, informationists had impact in several areas, including data storage, data archiving, and data management planning, and were able to help the PIs make informed decisions about their data. Moreover, the informationists were able to contribute their expertise to other areas such as literature searching, which helped the team make progress toward their research outcomes.

In addition to its impact on biomedical research, the award also had an impact on the research abilities of the informationists. Many informationists improved their research skills and gained a better understanding of the researchers they serve. The informationists also mentioned that they would take their newfound skills and connections back to their library to create new data management consultation programs or offer informationist services for other PIs in their community. Focusing on learning and skill-building experiences that would benefit the entire community could help reduce the worries of some informationists that they were spending too much time on a single research team.

The secondary goal of the informationist award was to evaluate the impact of the informationists' contribution to gain more evidence of the value of this emerging field. Many informationists noted the challenge of measuring changes in research behaviors and outcomes, especially in such a short time frame. Informationists from other institutions have

found it similarly difficult to assess their roles. Although there have been some advances in measuring the value of clinical informationists, generally using measures tied to time or cost savings for physicians (Lyon et al. 2004, Mulvaney et al. 2008), there remains a lack of evidence of the value and effectiveness of informationists in general, and data/research informationists in particular (Guessferd 2006, Rankin, Grefsheim, and Canto 2008). Given that evaluation is a central requirement of the award, further research is needed on the best method of evaluating such projects.

One of the valuable things that arose from the focus group discussion was the importance of sharing failures as well as successes. Too often, successful projects can overshadow less successful projects, and informationists who struggled can feel like failures. One beneficial outcome of the discussion was the stories about the challenges informationists faced, including communication and equipment problems. Although many informationists felt they had learned a lot from participating on the research team, they also struggled, and sharing these struggles was an educational and perhaps cathartic experience. This also illustrates the importance of having a strong community of practice, something that the focus group attendees felt was currently lacking in the informationist field.

Our results suggest some best practices for future informationists. First, informationists should carefully select their collaborating research teams. Librarians from the NYU Health Sciences Library, which has received four informationist awards, scheduled research data discussions with research teams that they had identified using the NIH RePORTER database (Williams and Rambo 2015), an approach that others might consider. Informationists should also take time to create a thorough project plan, which might include data interviews (Read et al. 2015), evaluation benchmarks, and a communication plan. Finally, in order to address the desire of some PIs for more computer science skills, informationists might wish to investigate professional development options for programming or data science.

This evaluation was limited to a very small cohort of NIH-funded researchers and informationists working specifically on biomedical research data management tasks. Although we did receive constructive feedback from several of the PIs, their responses might have been biased by our affiliation with the NLM. Our sample was also gathered through convenience sampling and therefore might have been impacted by the informationists who were able to attend MLA. Furthermore, the focus group data were coded by one person rather than multiple people, which may have biased the results. More research is needed to evaluate other approaches to data management support for biomedical research teams and to establish the best methods for evaluating an informationist's impact and value. Further evaluation of the role of the informationist will be essential for establishing best practices for this emerging field.

Supplemental Content

Appendices 1 and 2
An online supplement to this article can be found at http://dx.doi.org/10.7191/jeslib.2016.1095 under "Additional Files".

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Disclosure

The author(s) report no conflict of interest.

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