

Assessing the National Library of Medicine's Informationist Awards¹

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Abstract

Objective: To assess whether NLM-funded informationists enhanced NIH-funded biomedical research and evaluated the value of their contributions to the research team, and to understand the overall experience of informationists and researchers who worked together.

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

Results: Informationists had 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. Assessment of the impact of the informationists on the research 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 Informationist Supplement Awards were a successful mechanism for immersing informationists into research teams and building data management skills in the projects supported.

Introduction

NIH-funded informationists enhance biomedical research when embedded in basic and clinical research teams. The term informationist was first proposed in a 2000 article by Davidoff and Florance in the *Annals of Internal Medicine* (1). 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, while others felt that it was a role already being played by clinical librarians (1). Since 2000, informationist programs have appeared in the medical libraries at Vanderbilt and Johns Hopkins, as well as the clinical center library at the National Institutes of Health. 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 original article was published, the 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 to succeed (2). Following the success of the conference and realizing that librarians might require additional training, the NLM created a fellowship training program for informationists; between 2003 and 2008 nine fellows were selected and pursued internships and coursework to support their enhanced role as informationists (3). 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 extramural NIH grant-funded research teams 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 goal of the funding award is 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 (4). Eight two-year supplement awards were given out in 2012 and an additional eleven were disbursed in 2014.

Given the continued funding for the NLM administrative supplement awards (the third round was announced in 2015), the library was interested in assessing the program outcomes to date. The goal of this assessment was to determine whether the informationists had been successful in furthering biomedical research and evaluating their value and impact, and to gain insight into the overall experience for both the researchers and informationists.

Methods

We used a mixed methods approach consisting of a survey of the principal investigators from the 2012 projects, and a focus group of informationists to gain perspective from members of the research teams as well as the informationist award recipients.

Principal Investigators (PI) Survey

We created a survey to distribute to the principal investigators 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, we decided to reach out only to the eight PIs who had received informationist awards in 2012 as they would be in a better position to reflect upon the experience. The survey questions focused on the impact of the informationist on the team's research, and specifically asked about the informationist's effect on the data management areas outlined in the funding announcement (data capture, data storage, data organization, and so on) as well as on more traditional librarian tasks like literature searching and systematic reviews (a copy of the survey instrument can be found in the supplemental materials, online only). Additional survey questions asked about the

informationist's contribution to the research process as well as the most useful thing the informationist had done for the team. Finally, to get 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. Once 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 assessment of the program as they could explain their contribution to biomedical research, state whether or not they were able to evaluate their role's value, 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 award's initial applications.

The focus group questions addressed three areas: research impact, evaluation, and experience (the complete list can be found in the online supplemental materials). While not every question was asked, the key topics were covered. 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 or not the informationists had stayed 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 overall experience of the award, specifically what had gone well and what hadn't, what the informationists wish they had known, and whether or not they would do another

informationist project. As the focus group participants were in different stages of their award we designed the questions so they could be answered retrospectively as well as 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 creating categories for data coding. The codes were then applied to the transcript in an iterative process. Finally, the data were grouped into codes and summarized using an axial coding process (5).

Results

Principal Investigators Survey

Enhancing Biomedical Research

Of the eight PIs that received the survey six responded (75% response rate). The first set of questions asked about research impact, to gauge the informationist's ability to enhance the team's research. When asked about overall impact on their research 4 of 6 PIs said the informationist had "some impact" on their research and 2 of 6 said the informationist had a "large impact." In response to whether the informationists changed how the team conducted research 5 of 6 said yes. The question of whether working with an informationist had contributed to making progress towards research project outcomes produced similar results, with 5 of 6 saying yes (Table 1, online only).

Of the research data management areas mentioned in the survey the informationists had the most impact on data storage/archiving, data management planning, data organization and data capture. The informationist had less impact on data dissemination/sharing, database training, data visualization/presentation and data integration (Table 2). When asked about more traditional library skills, the PIs selected literature searching as the area of most impact while the remaining categories were seen

as less impactful by the majority of respondents (Table 3, online only). The PIs were also given a chance to share what they believed to be the informationist's most valuable contribution, the responses included convincing the PIs to get online centralized file storage, assuring partners of data security, identifying resources relevant to data, identifying appropriate sources of information, and developing a data model.

[insert table 2]

Overall Experience

While none of the PIs reported adding an informationist to other research projects 1 of 6 said that the informationist was still working on their research team. When asked if they would add informationists to future projects all the PIs responded in the affirmative although they checked additional funding, time and/or training as necessary inputs (Table 4, online only). Finally, we gave the PIs a chance to share what they would have done differently. In the three constructive comments submitted the PIs mentioned wanting someone with more programming skills, database training, and more knowledge of the NIH research process.

Focus Group Results

Thirteen out of thirty one informationists attended the session, four from the 2012 round of the award, eight from the 2014 round and one from both rounds. In total they represented eight institutions.

Enhancing Biomedical Research

While only the PIs could really say if their team's research had been enhanced by the informationists, the informationists did share some ways in which they believed they had improved the research process, including organizing data and increasing awareness of 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 their department was now integrating systematic review training into the curriculum.

Although it wasn't specifically asked in the focus group, one of the themes that emerged was that many of the informationists felt that their research skills had been enhanced by the informationist award. 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 then allows them to become in-depth partners in research."

Evaluation

The informationists were asked to evaluate the impact and value of their position as part of the requirements for the award. The focus group discussion revealed that this evaluation was a challenge for many of the informationists. Although all of them had created an initial plan as part of their application, only one or two had been able to implement it or were on track to implementing it. One of the major impediments was coming up with an evaluation method that would measure their 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 major challenge was the difficulty of integrating evaluation into the timeline and scope of the award. One participant mentioned that they would have liked to do an evaluation a year or two down the road, as they couldn't implement something and then immediately ask how it was working. Another informationist shared that her research team didn't like the focus on evaluation, and wanted her to focus solely on the research product outcomes instead.

Overall Experience

The overall experience of the informationists was very mixed. In addition to the challenges of integrating evaluation, many faced challenges related to differing expectations with their research team and personnel changes in the middle of the funded time period. Other projects stalled or didn't get off the

ground, whether because crucial equipment broke, or researchers were stuck in a non-productive stage of research. Several participants mentioned challenges related to communication, both with their grants offices and with their 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 put it: “it would take many months to get a meeting and then we would be canceled and canceled.”

In order to overcome the challenges they faced, many of the informationists identified strategies that they felt had helped them succeed. These included setting clear expectations, working with emerging investigators, working in a team of informationists, and frequent communication. Because lack of communication could be a major stumbling block several participants mentioned the necessity of participating in team meetings. Team meetings were often the way the 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.” For many informationists, attending lab meetings was the best way to embed themselves in the research team.

Unexpected Finding

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 university community. Not only did this restrict the amount of other projects they could participate in, but they felt like 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 that they would be able to parlay their new skills into 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 through the improvement of data management practices.

Enhancing Biomedical Research

The main goal of the NLM administrative supplement was to enhance biomedical research through the integration of an informationist focused on data management. The results of the survey and focus group showed that informationists were able to make many contributions in this area. According to PIs, the informationists had an impact on their research process and helped them make progress towards their research goals. When looking just at the data management issues that were the focus of the award, the informationists had a large impact in several areas and were able to contribute their expertise in many ways that the PIs found very useful. Moreover, the informationists were able to contribute their expertise in other areas such as literature searching and indexing that helped the team make progress towards their research outcomes. While these more traditional information science areas were not the focus of the award, they were found to be incredibly useful and could be seen as an entry point for engaging with researchers.

Research Impact on Informationist and Libraries

In addition to the impact on biomedical research the award also had an impact on the research abilities of the informationists. Many of the informationists improved their research skills and gained a better understanding of the researchers they serve. Many mentioned that they would take their newfound skills and connections back to their library where they would lead to the creation of new programs or services for the wider community. In this way the impact of the award could actually be much wider and have a broader impact on biomedical research. This sharing model could help assuage the worries of

some informationists that they were spending too much time on a single research team, by framing the projects not as a distinct project for a distinct group, but a learning and skill building experience that would benefit the entire community.

Evaluation

The secondary goal of the informationist award was to evaluate the value and impact of the informationists' contribution in order to gain more evidence for this emerging field. Many of the informationists noted the challenge of measuring changes in research behaviors and outcomes especially in such a short timeframe. Informationists from other institutions have found it similarly complex to assess their roles. A search of the literature revealed that while there have been some advances in measuring the value of clinical informationists (6-8) there remains a lack of data and evidence for the value and effectiveness of informationists in general (9-11). Given that evaluation is a central requirement of the award there needs to be more research on the best method of evaluating such projects. Future informationists might also benefit from evaluation guidelines or examples.

Overall Experience

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 of the benefits of this evaluation was therefore the stories about the challenges informationists faced, including communication and equipment problems. While many of the informationists felt like they had learned a lot from the award, they also struggled, and sharing the struggles was an educational and perhaps cathartic experience. This also illustrates the importance of having a strong community of practice, something that is currently lacking.

Best Practices

The results of the focus group and survey suggest some best practices for future informationist awardees. First, informationists should carefully select their collaborating research teams. NYU Health Sciences Library, which has received four informationist awards, used data from the NIH RePORTER database and informal discussions to identify potential collaborators, an approach that others might consider (12). Informationists should also take time to create a thorough project plan, which might include data interviews (such as the ones described by Read et al (13)), evaluation benchmarks, and a communication plan.

Limitations and Future Research

This evaluation was limited to a very small cohort of NIH-funded researchers and informationists working specifically on biomedical research data management tasks. Our sample was also gathered through convenience sampling and therefore might have been impacted by the informationists who were available at the time. Furthermore the focus group data was coded by one person rather than multiple people which may have biased the results. Although our findings suggest that the informationists had a positive impact on biomedical teams, more research needs to be done in order to evaluate other kinds of informationists and to establish the best methods for evaluating an informationist's impact and value. These research questions as well as further evaluation will be essential for establishing the evidence and best practices for this emerging field.

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Tables

Table 1. Overall Impact Questions (online only)

Question	Yes	No
Has working with the Informationist(s) changed how you and your team conduct research?	5	1
Has working with the Informationist(s) contributed to making progress towards your research project outcomes?	5	1

Table 2. Research Data Management Areas of Impact

Research Data Management Areas	High 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 3. Literature areas of Impact (online only)

Literature Areas	High 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

Table 4. Additional Needs (online only)

Would you add informationist 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

Supplemental Materials (online only)

Principal Investigators Survey

[See attached PDF file]

Focus Group Questions

1. Was the project successful in achieving your stated goals? (Does it seem like it will be successful?)
2. What methods did you use to evaluate your contribution as an informationist? (What methods are you using?)
3. Have you continued to work with your research team once funding ran out? (Do you think you will continue to work with your research team?)
4. As a result of this project have you started working with other research teams? (Do you think you will start working with other research teams?)
5. Has your involvement as an informationist improved the data practices or added value in some other way to the project outcomes of your research team?
6. Would you do another informationist project? If so, what would you do differently?
7. What do you wish you had known before you began your informationist work?

NLM Informationist Program Evaluation

This survey is designed to gather feedback on the National Library of Medicine 2012 Administrative Supplement for Informationist Services Grant.

Your responses to the survey will be aggregated and kept confidential. If you have questions, please contact Ariel Deardorff at ariel.deardorff@nih.gov or 301-496-4944

1. How often did you interact with the Informationist(s)?

- Never – they worked with other team members
- Quarterly
- Monthly
- Weekly
- Daily

Comments

2. How much of an impact did the Informationist(s) have on your research?

- No impact
- Some impact
- Large impact

Comments

3. How much of an impact did the Informationist(s) have in the following areas related to research data?

The Informationist(s) did not work on this area on my grant

	No impact	Some impact	Large impact	The Informationist(s) did not work on this area on my grant
Data Management Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Capture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Storage/Archiving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Integration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Visualization and Presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Dissemination/Sharing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Database Training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments

4. How much of an impact did the Informationist(s) have in the following areas related to research literature?

The Informationist(s) did not work on this area on my grant

	No impact	Some impact	Large impact	The Informationist(s) did not work on this area on my grant
Literature Searching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Critical Appraisal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Systematic Reviews	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indexing and Classification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information Visualization and Presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Measuring Impact of Research/Bibliometrics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments

5. Has working with the Informationist(s) changed how you and your team conduct research?

Yes

No

Comments

6. Has working with the Informationist(s) contributed to making progress towards your research project outcomes?

Yes

No

Comments

7. What is the most useful thing the Informationist(s) did for your research?

8. Is the Informationist(s) still working on your research team?

Yes

No

Comments

9. Would you add Informationists to other research projects?

- Yes – I already have
- Yes – if there was additional funding
- Yes – depending on the research needs of the grant
- Yes - if the Informationist had more training in my discipline
- Yes – if the Informationist had more data management training
- Yes – if the Informationist could dedicate more time to my project
- No – library services are sufficient
- No – Informationist services were not necessary for my research project
- No – My data management needs are met by other units at my institution

Comments

10. Is there anything you would have done differently about this collaboration?