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http://dx.doi.org/10.1080/13614533.2017.1330219

Developing the librarians' role in supporting grant applications and reducing waste in research: outcomes from a literature review and survey in the NIHR Research Design Service

Running Title: Information services for developing research grants

Abstract. Librarians and information specialists' involvement during the development of grant applications for external funding can save researchers' time, provide specialist support and contribute to reducing avoidable waste in research. This article presents a survey of information specialists working for the National Institute for Health Research's Research Design Service within English applied health services research, and a scoping review to identify other examples of librarians supporting grant applications. The survey found that support included: checking the proposed research has not already been done; literature searching to provide background for the project; advising on or writing systematic review methods. The scoping review found three examples where librarians were involved: in writing sections of the application; conducting reviews and becoming a co-applicant. We recommend librarians engage with researchers by checking whether search requests are to support an application and by becoming familiar with resources and techniques to support grant proposal development.

Introduction

This paper aims to demonstrate how librarians can use their expertise to support researchers writing grant applications and contribute to efficiencies in the process. We describe examples of librarians' involvement in research grant writing. We conducted a survey and analysis of information services provided by a research funder via university-based librarians. As we felt this model of librarians routinely

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involved at the grant application stage might be unique, we also undertook a scoping review of international literature looking for other examples of librarians supporting grant applications.

We also identify databases, websites and search strategies that librarians can use to determine research gaps and check the novelty of a research idea. We present other 'non-searching' activities that librarians undertake to support grant writing. Together, these activities reveal a broader role for librarians in reducing avoidable research waste through supporting research grant development.

In order to undertake research, most researchers need to apply for funding (grants) from a research council or other external funding body. Grant applications are highly competitive, for example the UK Medical Research Council funded 20% of its grant applications in 2015/16 (Medical Research Council, 2016). Time and effort can be wasted if researchers develop grant applications for research that has already been undertaken, or is deemed too low priority for funding. Grant applications must demonstrate a novel idea and in-depth, up-to-date knowledge of the research field. Librarians are well placed to support grant writing and contribute to efficiencies in the process.

Background

Avoidable waste in research

In 2009, an article highlighting the issue of avoidable waste in research claimed that 85% of biomedical research funding is unnecessarily wasted (Chalmers & Glasziou, 2009). Five years later, The Lancet ran a symposium "Research: increasing value, reducing waste" looking at the increasing global investment in biomedical research,

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and how much of this research does not lead to worthwhile achievements. It produced a series of reviews, each looking at the problem from a different angle: (i) that funding decisions should be based on how relevant the research is to users (Chalmers et al., 2014); (ii) that the most appropriate research design methods and analysis should be used (Ioannidis et al., 2014); (iii) that regulators of research should use their influence to reduce other causes of waste and inefficiency in research (Al-Shahi Salman et al., 2014); (iv) the importance of fully reported and accessible research information (Chan, Song, & Vickers, 2014); and finally (v) the importance of unbiased and usable research reports (Glasziou, Altman, & Bossuyt, 2014).

In 2016, Moher et al revisited the recommendations and questioned progress made over the previous two years (Moher et al., 2016). Kirtley (a librarian based at the EQUATOR network) responded to this by suggesting there is one group who have not been discussed, that is librarians and information specialists, who have the skills to contribute and support the research waste agenda (Kirtley, 2016).

Librarians can (and do) help avoid research waste, assisting researchers by checking the novelty, relevancy and appropriateness of their research design before they invest time in grant writing. They do this by finding relevant ongoing research, existing research, research methods guides and reporting standards guides.

National Institute for Health Research tackling waste in research

This paper focusses on the National Institute for Health Research (NIHR) which was an early adopter of recommendations to avoid waste in research. It is also the main funder of the research grants for which the authors provide support.

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The NIHR was created in the United Kingdom in 2006 as part of a government strategy to improve health research. Its mission "to create a health research system in which the NHS supports outstanding individuals working in world-class facilities conducting leading edge research focussed on the needs of patients and the public" (Department of Health, 2006). The NIHR began a transition programme to ensure NHS spending on research was transparent, accounted for, planned, and focussed on delivery. This included consolidating research programmes, developing research networks and collaborations, and putting in place a research infrastructure (National Institute for Health Research, 2016b).

The NIHR is committed to 'adding value' and reducing waste in research. This means maximising the potential impact of its research by making sure it: answers the right questions; is designed, conducted and analysed appropriately; delivers the research efficiently and that the results are published in full in an accessible and unbiased report (National Institute for Health Research, 2016a). The NIHR attempts to reduce waste in research by encouraging applicants to consult the literature before applying. It requires proposed research be informed by a review of the evidence, referencing existing literature and ongoing research studies. Proposals should explain how existing evidence informs their study and how it adds to the current body of knowledge (National Institute for Health Research, 2016e) (National Institute for Health Research, 2013).

To increase the number of high quality applications being received by funding bodies, the NIHR commissioned ten regional Research Design Services (RDS) across England to provide free design and methodological support to health (and later social care) researchers developing grant applications. Although a national

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service, the RDS is delivered regionally by a range of methodologists. (National Institute for Health Research, 2016g)

Grant writing support by the NIHR Research Design Service

NHS researchers and their (usually academic) partners are encouraged to approach the RDS at any stage when preparing their grant application for funding from national funding bodies. These include: the NIHR's own funding streams; Research Councils; or large national charities. Researchers are assigned an adviser who will discuss any design issues associated with their application. This can include: study design methods; involving lay people in their research; directing the researcher to appropriate funding streams or collaborators; or reviewing a final draft. Staff are often spread across several local centres in a region (e.g. in Leicester and Nottingham within the East Midlands RDS). Some regions include information specialists in the team. Their role includes helping researchers identify the evidence base for their research question guided by the NIHR recommendations for literature searching (National Institute for Health Research, 2013).

Survey of Information Specialist support in the NIHR Research Design Service

Purpose

Embedded librarians with the title 'Information Specialist' have been part of the NIHR Research Design Service since its formation in 2008, however coverage is patchy across the regions and their local centres. We wished to establish how many information specialists were employed as advisers within the RDS, identify their typical activities, and the search methods and resources they use.

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Methods

In August 2016, the ten RDS regions were contacted to identify all information specialists within their regions and local centres. A structured questionnaire covering information specialist provision and typical activities was then emailed to the information specialists (or the initial RDS contact when the information specialist was unknown or there was no service). RDS contacts were requested to forward the questionnaire to staff who advise researchers on literature search topics. The questionnaire (a mix of tick box and free-text answers) was created by the authors (JW, NK) using the Bristol Online Survey tool and modified following a pilot in a different region (MEO). Responses were collated and analysed to determine commonalities and variations in literature searching activities between the regions.

Results

Ten staff responded from eight regions. Six were information specialists from four regions, and four non-information specialists from four regions without a dedicated information specialist. Some questions were not answered or were not applicable to all respondents. The survey provides a descriptive narrative of information specialist support during the grant application process.

Four regions fund an Information Specialist post, varying from 0.6 to 1 full-time equivalent. This is usually split among several staff and may be shared between local centres. All the information specialists are librarians with systematic review expertise and research experience. They are based in university health research departments rather than employed by academic or NHS libraries. In three regions, the information specialists undertake RDS work alongside other research support duties for their institutions. In one region the information specialists are employed solely to support the RDS. Regions (and local centres) without an information

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specialist rely on other RDS advisers to provide literature searching support, but may contact other university-based information specialists, with systematic review expertise, to support grant proposals containing a systematic review.

We found that information specialists identified the evidence base for research questions and supported research design in several ways ranging from quick enquiries to several days' work. A snapshot of the level of search activity conducted in the East Midlands region and Leeds local centre (part of the Yorkshire and the Humber region) for one year (September 2015 – August 2016) showed 101 proposals were supported and that services included: advice-only (4); scoping searches (76); current research checks (73); searches and planning to support full systematic reviews (10). This level of data on service provision was not supplied by the other regions and centres.

Information specialists receive their RDS enquiries in several ways: via an enquiry registration form; referral from another adviser (methods expert working for the RDS); or direct contact from the researcher. They usually meet the researcher personally in a one-to-one meeting to establish the nature of the query (similar to a reference interview) although one region communicates by email owing to the remote locations of researchers. Most non-information specialist advisers also meet the researcher personally, although typically as part of a larger meeting between the researcher and several specialist advisers.

For all RDS advisers the time spent on a typical proposal varies with the nature and complexity of the question, ranging from 1-2 hours to several days. For example, advising a researcher on how to search a trials register is much quicker than designing and running searches to scope the evidence base for a research topic.

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The eight regions that responded to the survey provide the researcher with search advice and five also provide search strategies and search results. These five regions also advise on or supply text describing literature search methods for use in grant applications. Almost all advisers routinely search for any ongoing or recently published research.

The survey identified some differences between the search activities of information specialists and other RDS advisers. In general, information specialists tend to spend longer on an average query (e.g. 0.5-1 day versus 1-2 hours) but all types of adviser stressed this was dependent on the researcher's need. Information specialists also used a wider range of resources such as subject specific databases and the NIHR research projects webpage. They sometimes search for research recommendations related to the proposal and use more sophisticated search techniques, such as restricting searches to MeSH (Medical Subject Headings) index terms rather than designing long search strings to retrieve relevant papers for quick research checks.

Literature searching is not the only task undertaken by RDS information specialists. Column (a) in Table 1 illustrates the full range of activities performed (other columns relate to tasks identified in the literature review and will be reported later). The survey indicated variation in involvement depending on the requests made and the information specialist's research experience. Some are 'typical' librarian tasks, but others support the design of the research.

TABLE 1. Activities undertaken by librarians in grant applications: comparing the results of our survey with the literature review

Activities undertaken	Organisations (see below)			
	(a) RDS	(b) UoU	(c) UBC	(d) LTU

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Consultations with researchers on specific grant applications	✓	✓	✓	✓
Literature searching	✓	✓	✓	✓
Supporting reference management	✓			✓
Searching for ongoing research	✓			
Checking for research priorities/known uncertainties	✓			
Supporting literature reviews for grant applications	✓		✓	✓
Giving advice on systematic reviews and other evidence synthesis methods	✓			
Authoring sections of literature review as part of the grant application	✓	✓	✓	
Giving advice on reporting methods	✓			
Suggesting co-applicants or funding streams	✓			
Training researchers in reference management/ critical appraisal	✓			
Reference checking, document supply	✓			
Reviewing grant application before submission	✓		✓	
Acting as a mock panellist	✓			
Becoming a co-applicant on a grant*	✓	✓	✓	
Co-authoring grant application (other than literature review section)		✓	✓	
Writing assessment plans and logic model of impact		✓		
Research Impact Service (bibliometrics)				✓

Organisations
(a) RDS: RDS Information Specialists, England, UK. (2016)
(b) UoU: University of Utah, USA (Ziegenfuss & Furse, 2016)
(c) UBC: University of British Columbia (Janke & Rush, 2014)
(d) LTU: La Trobe University Melbourne (Karasmanis & Murphy, 2014)

*If an RDS Information Specialist becomes a co-applicant they can no longer support the grant as an ‘RDS Adviser’ but can be a co-applicant as a member of their host institution.

Impact of Information Specialists in the Research Design Service

Information specialists may have a positive impact on grant applications: firstly, by improving the quality of applications submitted (leading to ultimate success), or secondly by terminating a research question not worth pursuing. Helping researchers decide to drop or change their original question saves time and resources being wasted on the ‘wrong’ question. The survey indicated information specialists are

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associated with high quality applications. A breakdown of data from 101 grant consultations in 2015/16 seen by the information specialists from East Midlands and Leeds found that of the 50 grant applications ultimately submitted to funders, half were successful in either moving to the next stage of selection or were funded (if the selection process was one stage). To put this in context, the MRC only funded 20% (Medical Research Council, 2016) of all grant applications submitted in the UK in 2015/16.

Outside the survey, these examples from the authors' own experience demonstrate how literature searches impacted on the proposed research design and avoided research waste by changing the research question in a grant application.

Example 1. The researcher requested methodology support to plan the systematic review element of a larger research project. The information specialist performed preliminary searches which identified a recent study with a very similar title. The researcher had to re-think their question to build on the current literature and avoid duplication. The information specialist also contributed to the review's design by suggesting a more appropriate set of databases for the planned search, advising on a robust search strategy and calculating the likely size of the review.

Example 2. The information specialist was asked to provide scoping searches to plan a systematic review. An initial current research check identified a systematic review with a similar title to the proposed research, published in the last year, unknown to the project team. The project team ceased work on the proposal while the lead applicant reconsidered their question.

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Review of the literature - The role of information specialists in research design

Purpose

Much has been written over recent years about the need for librarians to change their working practices to match the move to a digital age. New roles include clinical librarians, embedded librarians, informationists and knowledge brokers, among others. We wanted to determine whether there was any evidence of librarians or information specialists primarily involved during research design. A scoping review was conducted to find examples of librarians directly involved in collaborating with researchers during the grant writing stage of funding applications, and to determine their input.

Methods

Literature searches. Six databases were searched in October 2016: Medline; Embase; HMIC (Health Management Information Consortium); LISA; LISTA; and Web of Science (Science Citation Index, Social Science Citation Index and Arts and Humanities Citation Index). The databases were searched from 2005 to present (October, 2016). The start date was chosen to correspond with changes in NHS research funding and the formation of the NIHR in 2006). Although the databases were weighted towards health literature, it was hoped that searching Web of Science and the two LIS databases would identify these roles in other disciplines. A sensitive search was conducted, using free text terms and subject headings, to find any possible job title variations (librarian* or information specialist* or information professional* or information officer* or information scientist* or knowledge manager* or knowledge broker* or informationist*) and (grant* or fund*) and (design* or develop* or apply* or application* or write or writing or proposal* or protocol*)

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Inclusion and exclusion criteria. Articles were included if they discussed an example of collaboration between a librarian and researcher during the design or writing of a grant application for external funding. Articles were excluded: if they discussed librarians applying for funding for their own research; if they were involved in teaching researchers; where librarians were involved in systematic reviews once funding had been awarded; or about a library's curatorial functions such as data-management, open access or digital repositories.

Results

A total of 101 references were retrieved (after removing duplicates). A preliminary scan found 33 to be irrelevant. Sixty-eight abstracts were screened by the authors, and full text of 31 obtained for further review. Two conference papers and another two articles from the reference lists of included papers were added.

A literature review (Cooper & Crum, 2013) examining the changing roles of health sciences librarians identified several new and emerging roles, including that of Grants Development Librarian. An earlier survey (Glenn & Rolland, 2010) explored the emerging roles for information professionals in biomedical research teams one of which was grant and manuscript writing support. It found that "participants' time and effort were increasingly being incorporated into sponsored research (i.e. grants and contracts). As they became more involved in the grants themselves, they were also becoming more involved in writing the grant proposals and developing the resulting manuscripts". The survey gave no more details, so we do not know whether this example has been more fully described. Another review and survey conducted as part of a needs assessment to develop research and grant support services at the University of Arizona (Andrade & Kollen, 2012) also provided limited information but

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indicated that grant support included reviewing grant proposals, one-to-one consultations to identify funding, and serving as co-investigators.

Our searches found three articles explicitly describing collaborations with researchers during the development of grant applications. Table 1 (columns b-d) summarises these activities. At La Trobe University Library, Australia this included supporting literature reviews as part of grant applications (Karasmanis & Murphy, 2014). At the University of Utah USA (Ziegenfuss & Furse, 2016) and the University of British Columbia, Canada (Janke & Rush, 2014) it involved co-authoring and becoming full participants on the funded project.

At La Trobe University the involvement came when the Library was trying to extend its services to users. It began as a trial to develop an Advanced Customer Search Service to support literature reviews for grant applications and funded projects. They also developed a Research Impact Service to provide research metrics (bibliometrics) which researchers could use to support their grant applications (Karasmanis & Murphy, 2014)

In the other two studies the librarian was asked to join the research team. At the University of British Columbia the librarian became a co-investigator on a project investigating best practices for newly qualified nurses (Janke & Rush, 2014). The librarian was involved early in the process and both edited and reviewed the grant application before it was submitted. A grant project at the University of Utah involved a librarian taking the opportunity to collaborate with a professor to write a National Science Foundation (NSF) grant, become an active participant in the grant and co-teach a faculty development Massive Open Online Course (MOOC) (Ziegenfuss & Furse, 2016).

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Benefits of involvement in grant applications

In each case, involvement at the grant development stage led to an extension of the library or librarian's usual role. The Advanced Customer Search Service trial (Karasmanis & Murphy, 2014) showed a change from teaching research skills (for example, literature searching) into more of a research role, and the development of expertise through being involved in more systematic searches. It also opened up fresh initiatives and opportunities for closer integration and was reported to be a highly regarded search service for researchers.

At the University of British Columbia (Janke & Rush, 2014) the librarian was funded as a co-investigator on the research project. In addition to literature searching, he was involved in other aspects of the project not usually considered traditional roles for a librarian. After developing search strategies for the literature review (Phase 1) he conducted an initial screen and weed of the search results before principal investigators did the final screening. He contributed to the methods section of the Phase 1 report, wrote the literature review section of selected manuscripts, and gave recommendations of possible journals in which to publish. He was also involved in translation and dissemination of the project findings.

At the University of Utah (Ziegenfuss & Furse, 2016) a request for an educational literature review for an NSF grant led to the librarian becoming a partner on the grant. Her education background and previous experience with grant writing provided confidence for suggesting additional contributions and improvements to the grant, such as writing an assessment plan and developing a logic model to help lay out the desired impact, outcomes and phases of the project. The librarian and faculty

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member have since collaborated on numerous conference presentations, workshops and seminars.

This scoping review reinforces the findings of the study conducted by Andrade and Kollen (Andrade & Kollen, 2012). Both found very few examples of librarians or information specialists directly involved with researchers in the design of grant applications and limited detail describing their role. This is probably because grant-writing support constitutes a small part of the role of academic liaison or health librarians, rather than that they never participate.

Discussion

The results of our survey and scoping review show that librarians and information specialists are involved in various aspects of developing grant applications: but what information do researchers need when they are writing grant applications? Why is it important and which resources should they use?

Using information when developing a proposal for research funding

Researchers must demonstrate how their research idea fits with the existing evidence, and show that it addresses an important question. Grant application forms ask applicants to consider the relevant evidence with questions like 'Has the research been designed with reference to an appropriate review of the existing literature?' (National Institute for Health Research, 2016g). Funding panel members may check the novelty of proposed research by doing their own searches. A Research Design Service adviser observed a funding panel meeting and commented "They are very aware of other research in the field!! Panel members would conduct quick PubMed searches to see why some literature had not been mentioned – or to

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show that the proposed project was not novel/appropriate." (RfPB Panel Meeting, 2016)

Contributing to reducing avoidable waste in research

Kirtley suggests that librarians can contribute to two of the areas highlighted by the Lancet series when research is being designed and grant applications written (Kirtley, 2016). Firstly, by assessing the extent of uncertainty by checking for and identifying any relevant ongoing research, and secondly, by peer reviewing search strategies used to identify evidence in support of grant applications. Our survey showed RDS information specialists do more than this by: identifying ongoing research and existing evidence; supporting research recommendations and systematic reviews; and by providing advice and resources for designing, reporting and appraising research. Their input can be applied to the recommendations from all of the five papers in the 'avoidable waste in research' series. Below we discuss some of the types of information we search for, and how they link with the avoidable waste recommendations, and give examples of the resources we use.

Ongoing research. Ongoing research includes projects and clinical trials currently being conducted or recently completed, which have not yet been published in the scientific literature. It is important to know before spending time writing a grant proposal, that the work is not already being carried out by another research team. The recommendations about waste in paper 2 (which focusses on design methods and analysis) (Ioannidis et al., 2014) note that there is insufficient consideration of other evidence. It suggests researchers should anticipate evidence from continuing research when designing new studies. For example investigators designing new randomised controlled trials (RCTs) should consider previous trials and trials in progress to identify the most important remaining questions. Table 2 lists the sources

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of ongoing studies recommended by NIHR guidance (National Institute for Health Research, 2016a, 2016c, 2016d) and other sources RDS information specialists find useful to identify ongoing studies which may overlap with the proposed project.

TABLE 2: Databases and trial registries of current research

Databases and trial registries of current research	
Clinical trials.gov	https://clinicaltrials.gov/
UK Clinical Trials Gateway	https://www.ukctg.nihr.ac.uk/
PROSPERO	http://www.crd.york.ac.uk/prospero/
ISRCTN	http://www.isrctn.com/
Europe PMC Grant Finder	http://europepmc.org/grantfinder
NIHR Portfolio	https://www.journalslibrary.nihr.ac.uk/programmes/
WHO International Clinical Trials Registry	http://apps.who.int/trialsearch/Default.aspx

Existing (published) research. One of the first things RDS information specialists check for is a systematic review on the proposed topic. An initial search for existing systematic reviews can provide a useful summary of the research activity for that topic, indicating if it is already well researched or highlighting research gaps. Even if relevant systematic review already exist, further searching is recommended to identify additional evidence published since the review. Literature searches can help answer justification questions in application forms: 'Why is the research important in terms of improving the health of the public and/or to patients and the NHS?'; Please provide evidence explaining why this research is needed now (how does the existing literature support this proposal?' (National Institute for Health Research, 2016c, 2016d, 2016e). Published research can also assist with research design, as seeing how other researchers have tackled a problem may help an applicant with their own

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design (for example, what outcome measures have previously been used?) Potential funding streams or collaborators may also be identified from existing literature in the same topic area.

Paper 3 deals with increasing value and reducing waste in biomedical research regulation and management (Al-Shahi Salman et al., 2014). It suggests people regulating research should use their influence to reduce other causes of waste and inefficiency in research. This could be addressed by making grant approval conditional on researchers referring to systematic reviews of existing research. Librarians can use their expertise to search for existing systematic reviews and highlight their conclusions. They can also advise on the funder requirements to demonstrate knowledge of existing research in their application.

If there are no relevant systematic reviews, the applicant may undertake a scoping review to provide an overview of the topic to support their application. Unlike systematic reviews which answer well defined questions using appraised, high quality research, scoping reviews can cover broad topics, using all relevant research regardless of its quality to ‘map’ the evidence (Arksey & O'Malley, 2005). It is ideal for emerging research fields (Levac, Colquhoun, & O'Brien, 2010) to identify research gaps, and can help the researcher identify the best methods or research approaches to use. Scoping reviews are exploratory and summarise rather than provide syntheses of quality assessed studies like systematic reviews. They can identify the scope, establish parameters and the potential costs of a proposed systematic review (Armstrong, Hall, Doyle, & Waters, 2011). Morris et al have described in depth how librarians can become involved in scoping reviews (Morris, Boruff, & Gore, 2016).

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Our own scoping review identified an example of the benefits of a librarian's assistance to the researcher. The faculty member at the University of Utah (Ziegenfuss & Furse, 2016) saw the librarian's ability to help her with a meaningful literature review "as very high value – without which, she would not be able to obtain the grant".

When RDS information specialists search for existing systematic reviews and primary studies they check key health databases such as The Cochrane Library and Medline as well as more subject specific databases relating to each topic. Search strategies for grant application scoping searches are designed rapidly using search filters, where appropriate, to identify a manageable number of results for the researcher to review. Given the limited time they have to develop grants, many find a set of specific/targeted results most helpful.

Planning searches for a systematic review project. Information specialists may be asked to write the search methods for a planned systematic review. The NIHR suggests applicants include details of the size of the available literature base, a search strategy and 'details of the body of existing evidence that will be covered, and access arrangements (e.g. use of databases, hand-searching, communication with authors, etc.)' (National Institute for Health Research, 2016c, 2016d, 2016f). A draft version of a comprehensive search may be developed to support a systematic review grant application, together with costings for a librarian's time and document supply.

Supporting Research Recommendations. Health research funders are committed to making sure the research they fund has impact for patients and the public. It is crucial therefore, that the research undertaken answers questions that are important

to patients, or tackles areas where research evidence is weak or non-existent (known uncertainties). The James Lind Alliance (JLA) brings together clinicians, patients and carers in Priority Setting Partnerships to identify and prioritise these unanswered research questions (James Lind Alliance, 2016). The JLA known uncertainties can also be searched together with NICE research priorities via the NHS Evidence database by using a 'Known Uncertainties' filter. Table 3 lists databases and website resources of known uncertainties and research priorities set by funders and health organisations. In the first paper (Chalmers et al., 2014) suggested that research may not address the questions that are most relevant to the users of research, and recommends: investment in additional research should be preceded by assessment of existing evidence; sources of information about research in progress should be strengthened and used by researchers. By becoming involved with an application from an early stage librarians can check these priorities on behalf of the researcher. If the topic is identified as a priority this will add weight to the application. Researchers may consider re-focussing their question to address a known uncertainty. RDS information specialists routinely search for known uncertainties and recognised research priorities as well as checking recommendations for further research in systematic reviews and guidance documents.

TABLE 3: Resources for finding Research Priorities and Known Uncertainties

	Resources
Databases of known uncertainties	NHS Evidence http://www.evidence.nhs.uk/ (use 'known uncertainties' filter) SBU Swedish Agency for Health Technology Assessment and Assessment of Social Services Database of identified treatment uncertainties http://www.sbu.se/sv/sok-kunskapsluckor/?q=&t=KnowledgeGaps

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Research priority lists	James Lind Alliance Top 10s of priorities of research http://www.jla.nihr.ac.uk/top-10-priorities/ Joanna Briggs research priorities http://joannabriggs.org/research/identifiedReviewTopics.html Cochrane priority review list: http://editorial-unit.cochrane.org/cochrane-priority-reviews-list-2015-16
Funder research priorities (selected)	US AHRQ funding priorities http://www.ahrq.gov/funding/priorities-contacts/special-emphasis-notices/index.html NIHR Themed Calls http://www.nihr.ac.uk/funding-and-support/themed-calls/ Australian National Health and Medical Research Council's major health issues https://www.nhmrc.gov.au/book/nhmrc-corporate-plan-2016-2017/nhmrc-s-strategic-direction/major-health-issues Patient Centred Outcomes Research Institute National Priorities and Research Agenda http://www.pcori.org/ World Health Organisation http://www.who.int/topics/research/en/

Reporting research results. Paper 4 (Chan et al., 2014) focusses on addressing inaccessible research and gives examples of selective reporting for studies involving different drugs, and estimates some of the effects of such selective reporting. Paper 5 (Glasziou et al., 2014) discusses deficits in reporting that prevent researchers from replicating studies and from drawing valid inferences. At least 50% of research reports were found to be sufficiently poor or incomplete as to make them unusable. Librarians can conduct thorough literature searches, and stress the importance of critically appraising research using appropriate critical appraisal tools. They support full reporting by drawing attention to reporting guidelines such as the CONSORT statement (CONSORT). Many research funders have policies that specify the research data management practice expected from grant holders including data-sharing and data preservation. Academic librarians such as those at the University of Leeds are developing tools and resources to aid researchers with their data

management plans that must be submitted as part of a grant application (https://library.leeds.ac.uk/research-data). Librarians can also raise awareness of study protocol development guidelines, study design standards, and advocate and advise on deposit of final research reports. These issues are being actively addressed by a librarian (Kirtley) at the EQUATOR network (a global initiative to tackle the inadequate reporting of studies) (Equator Network, 2016).

Opportunities for librarians and information specialists

Our own experience and the results of our scoping review showed a number of opportunities for librarians and information specialists when involved at the design stage of a grant application. The librarian who was part of the Advanced Customer Search Service (Karasmanis & Murphy, 2014) found it opened up new opportunities for closer integration between La Trobe University Library and the research team and also provided an excellent search service for researchers. Librarians may become more embedded in the research term throughout the whole project (not just initial literature searches), for example, screening and appraising research and reporting methods in research reports (Janke & Rush, 2014), or presenting research findings at conferences and workshops (Ziegenfuss & Furse, 2016).

Working with research departments on projects helps to develop a better understanding of the needs of researchers. It can aid the librarian's own professional development as they learn more about the research process, and they may have a chance to do more than facilitate literature searching for evidence (Janke & Rush, 2014), or to learn new skills, for example in grant writing or critical appraisal.

As a result of the closer partnerships between librarians and research departments the library gains a better understanding of the needs of the research community, and can improve the services they provide, and a new awareness of what might be

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possible, to align a library's mission with their university's research aspirations (Karasmanis & Murphy, 2014).

Recommendations

- Librarians should be pro-active with known researchers making sure that they are aware of the range of skills the librarian can offer.
- When asked to perform a literature search or give information skills training find out whether it is in connection with a grant application for funding.
- Be aware of specialist sources available to support proposal searches.

Conclusions

For health librarians and information specialists, literature searching has long played an important role in supporting the research and clinical needs of the staff in their institutions. Information specialists within the Research Design Service provide tailored literature searching during the design stage of grant applications to establish background to the project or to support the research methods chosen. When a research proposal includes a systematic review, RDS information specialists will provide advice to the researcher on search methodology, reference management, reporting standards, review costings and may write the literature searching section in the application form. Information specialists in the RDS may also be involved in finding details of funding streams and their scope for researchers or RDS advisers. We are not aware of other funders or national organisations providing dedicated information specialist support for research design.

Librarians can, and we would argue should, play a role in preventing unnecessary waste in research, but they need to be pro-active, as researchers may not realise what they can do beyond literature searching. They can offer expertise in checking

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for existing research, or highlight where proposed research answers a question that is important to patients and the health service. They can also advise on reporting methods and standards to help ensure that the research undertaken is correctly reported, accessible and transparent.

Involvement in research proposals offers an opportunity to work closely with researchers which may also lead to librarians or information specialists being included as part of current or future funded research teams. The diversity of the research ideas, funding bodies and possible sources of evidence make grant proposal work challenging but also fascinating and rewarding. It helps the librarian develop professional skills in project work, report-writing, the grant application process and wider university issues. It can also raise the profile of librarians within the research team and lead to further opportunities.

Acknowledgements

We would like to thank Research Design Service staff who contributed to our survey including RDS Information Specialists; Susan Bayliss, RDS West Midlands, University of Birmingham; Anthea Sutton and Suzy Paisley, RDS Yorkshire and the Humber, University of Sheffield; and Shannon Robalino, RDS North East, University of Newcastle.

All the authors are supported, at least in part, by the NIHR Research Design Service East Midlands or Research Design Service Yorkshire and the Humber. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

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