

Acknowledging Librarians' Contributions to Systematic Review Searching¹

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Abstract: **Introduction:** Academic health librarians are increasingly involved as members of research teams that conduct systematic reviews. Sometimes librarians are co-authors on the resulting publications, sometimes they are acknowledged, and sometimes they receive no recognition. This study was designed to query librarian supervisors' understanding of the extent to which Canadian academic health librarians are involved in systematic reviews and the manner in which their work is recognized. **Methods:** A survey asking 21 questions was sent to supervisors of librarians at all 17 academic health sciences libraries in Canada, querying the extent and nature of librarians' involvement in systematic review research projects and the forms of acknowledgement that they receive. **Results:** Fourteen responses to the survey were received. Results show strong expectations that librarians are involved, and will be involved, in systematic review research projects. Results related to supervisors' perceptions of the number of reviews undertaken, the amount of time required, the forms of acknowledgement received, and the professional value of systematic review searching varied greatly. **Discussion:** The lack of consensus among academic health librarians' supervisors regarding most aspects of librarians' involvement in systematic review projects, and the ways in which this work is and should be acknowledged, points to the need for research on this subject.

Introduction

Academic health librarians, as professionals with high levels of skill as expert searchers, are often called upon to perform systematic review searches. The Cochrane Handbook for Systematic Reviews of Interventions [1], Institute of Medicine (IOM) of the National Academy of Science's Standards for Systematic Reviews [2] and the Canadian Institutes of Health Research (CIHR) [3] recommend or require the involvement of librarians in systematic review search projects. Our purpose in this study was to examine the extent and nature of Canadian academic health librarians' activities in systematic reviews from the perspective of their supervisors, focusing on: volume of reviews completed, the length of time required to complete a review, the actual tasks performed while taking part in a systematic review project, how librarian activities in systematic review projects are recognized, and whether or not the form of recognition is related to the volume, time, and number of tasks completed by librarians as part of a systematic review project.

We surveyed supervisors of librarians for a number of reasons. Firstly, the supervisor's role is uniquely able to support and facilitate librarian collaboration on systematic reviews, which implies that how they view and understand

this work may determine whether work is supported and (or) allowed within the library. For example, supervisors may provide support by ensuring that their librarians have the autonomy, time, and administrative support to be able to collaborate with researchers on systematic reviews. Also, part of this support involves designing policies and procedures to help librarians negotiate with research teams, which in turn facilitates future collaboration. Given this supportive role, supervisors clearly play a crucial part in how the work of librarians on systematic reviews is recognized and acknowledged within the workplace.

Secondly, we are focusing on supervisors as other studies in progress focus primarily on the amount of work performed by librarians on systematic reviews, the types of tasks performed by librarians and credit received, and policies and procedures with respect to receiving appropriate credit, as reported by the librarians themselves [4–6]. Our aim is not to collect specific statistics of the work of librarians, but instead to use the results in this study as a snapshot of how supervisors understand and value the work of their librarians on systematic reviews. We hope to build an overview of the supervisor's perceptions of what their librarians do, thus providing a different and complementary perspective to other studies and a basis for more research.

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Literature review

Several studies have documented aspects of the extent and nature of librarians' activities in systematic review projects [5–8]. Overall, these studies reveal a general trend for librarians to be involved in key roles at most stages of the project. For example, Harris' [8] observational study of a librarian on a systematic review team discussed the active role librarians played in several stages of the process, indicating librarians worked in two major roles: as expert searchers and as knowledge organizers. More recently, Dudden and Protzko's 2011 article "The Systematic Review Team: Contributions of the Health Sciences Librarian" [6] details their research on the work of librarians on a systematic review team. Like Harris, they found that librarians worked as expert searchers and also as organizers and analyzers of the search results, involved in "communicating methods of the review process, collaboratively formulating the research question and exclusion criteria, formulating the search strategy on a variety of databases, documenting the searches, record keeping, and writing the search methodology" [6]. Murphy and Boden's 2014 benchmarking study [7] explored the participation of Canadian health sciences librarians on systematic reviews, focusing on the role of the librarians, barriers to their searches, and the existence of policies and guidelines. Seeking to create a benchmark for the work of librarians as part of systematic review teams, they note that librarians were still doing more "traditional" librarian roles (i.e., as expert searchers), as well as increasingly performing many new ones, including: "disseminator, critical appraiser, report writer, project manager, project leader, data extractor, and data synthesizer" [7].

Although these studies provide important information on the types of work librarians are doing on systematic reviews, they make little mention of the forms of recognition received by librarians for their work. What is more, while these studies point to trends in the kinds of work, little mention (outside of training) is made of the institutional support that they receive to conduct this work.

While authors have discussed the roles of librarians in systematic reviews, the IOM Standards for Systematic Reviews do the best job of defining a set of tasks that should be undertaken for a systematic review and recommend that an expert searcher should be involved for search planning and search review [2]. The IOM standards are the primary source for the list of tasks used in our survey of librarians' supervisors.

On the question of how much time is required to complete a systematic review search, Gann and Pratt [9] showed that in over 17 "systematic review/meta-analysis" searches, the average time required for completion was 23 hours, whereas "systematic review update[s]" required an average of 6 hours. Saleh et al. [10], studying 17 searchers, arrived at a similar conclusion of between 1.6 and 113 hours (mean 24.28 hours) to search all resources for a systematic review. These two studies provide a rough guide librarians can use to communicate their workload to both the research team and their supervisors. Supervisors, in turn, could potentially use these numbers to appropriately adjust the

workloads and responsibilities of their team, as well as to build a case for further support and institutional recognition (i.e., performance appraisals) for the growing demand for librarians to participate as members of systematic review teams. By inquiring about how much time supervisors believe that their librarians spend on systematic reviews we hoped to get a better picture of how librarian supervisors understand the role of systematic reviews in their librarians' workloads.

The question of how librarians are recognized for their work on systematic review projects is not a new one. In 2005, McGowan and Sampson [4] pointed out that "the librarian's contribution is central" and that librarians "should not be shy to negotiate authorship up front." Dudden and Protzko [6] noted that "[i]f extensive work is done librarians can also expect authorship status on the report of research. Librarians should be considered as authors if they made major contributions to the data gathering and methodology writing." Recently, Rethlefsen et al. [11] have encouraged librarian co-authorship after finding that systematic reviews with librarian co-authors have "higher quality reported search strategies." Also pointed out in the literature, is the fact that researchers may not consistently acknowledge the contributions of librarians because they misunderstand the full extent of the intellectual contribution: "... reviewers might not fully appreciate, or even understand, the librarian's intellectual contribution to the review. In fact, the librarian's contribution is central. A flawed or biased search can render the review useless, and ... a great deal of specialized knowledge goes into developing a search that results in a valid evidence base" [12].

Gore and Jones's 2015 article [13] details the extent of librarian involvement in a systematic review, and it offers some guidance for recognition of the librarian's contribution, noting that "the level of involvement in the research process should guide consideration for co-authorships and librarians should make this clear from their initial meetings with researchers, if appropriate." Working from the International Committee of Medical Journal Editors (ICJME) criteria for authorship, they also make note of the ways that librarians are especially suited to work as co-authors, through their ability to assume responsibility for the search strategy and to write the methods section of the manuscript. They also press the issue of authorship further, noting that librarians should at least be given the choice to receive an acknowledgement (or no credit at all) for their contributions to the systematic review, and also posit that library policy guidelines should be in place to help communicate terms for recognition of their work to the research team [13].

Despite these claims of the importance of librarians and their support for librarian recognition in systematic reviews, very little has been written on what librarians actually do to receive co-authorship, acknowledgement, or no mention at all. Further, little has been written on the extent to which supervisors understand the acknowledgement of librarians' work in systematic reviews.

Finally, little has been written about the extent to which systematic review searching has been formalized as a part of the normal work of academic health librarians

in Canada and the current nature of that work. How do supervisors value the collaboration on a systematic review? What is the expected output of librarians on a systematic review? Are there policies and procedures in place? Librarians at the University of Waterloo have queried the health sciences faculty on the importance and role of librarians in the systematic review process. Their research points to the fact that health sciences faculty members at the University of Waterloo do value and understand the role of a librarian on a systematic review. While this study is encouraging and does provide much needed insight into our roles as expert searchers on systematic reviews, the published findings do not discuss the kinds of recognition librarians should receive for the varying types of work they do [14]. Our project offers a glimpse into these questions, hopefully forming the basis for future discussions and research.

The importance of the perspective of librarian supervisors has been recently discussed in the literature. Gore and Jones [13], in their primer for managers, detail the importance and relevance of the work of a librarian on a systematic review, since “senior administrators and library managers must fully understand the steps involved in a systematic review or research synthesis, and the issues and opportunities that these methodologies raise in the use of library services and resources. Library leaders need to understand how the growing popularity of systematic reviews is impacting librarians so that services and resources can be planned and delivered accordingly.” Moreover, Gore and Jones [13] also discuss issues with respect to how systematic reviews are valued in tenure decisions, noting that institutional climate and lack of familiarity with the methodology of a systematic review are two key barriers to the inclusion of this output for tenure purposes. They also note “for librarians as well as their supervisors, it may be up for debate whether collaboration in systematic reviews should count as part of librarians’ core responsibilities or as scholarly activity.” This paper not only grounds itself in the research on the need for expert searchers, but targeting library leaders also underscores the important role they play in shaping librarians’ work. By examining the views of supervisors of academic health sciences libraries in Canada, we hope to expand this conversation between librarians and management, particularly with respect to developing policies and guidelines to support librarians in their work.

Defining authorship

The ICJME makes recommendations on what constitutes authorial contribution to a research paper and what does not. ICJME lists four criteria, all of which must be met for an individual to be an author:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the

accuracy or integrity of any part of the work are appropriately investigated and resolved [15].

The more traditionally understood work of librarians with a research team on a systematic review falls clearly in the first criterion of authorship. Defining the parameters of a systematic review, structuring the search, adapting it for various databases and writing the search part of a methods section of a paper are clearly all intellectual contributions to that paper. Although many librarians draft the search part of the methods sections of systematic reviews, read the final paper, and are accountable for the search-related aspects of the articles to which they contribute, we are aware from our own work as expert searchers and through discussions with colleagues, that librarians do not always have the opportunity to fulfil the final three criteria. Further, we are aware that librarians who fulfill all four criteria are sometimes included as authors, sometimes acknowledged in an acknowledgements section, and sometimes not mentioned at all.

Methods

A survey of 21 questions was developed on Google Forms and tested in-house prior to launch in the spring of 2015. Question formats included: Yes/No, Likert scales, select from list and open-ended, fill-in-the-blank (see [Supplementary Appendix 1](#)). A description of the project and draft survey questions received ethics approval. The survey and a cover letter explaining the project was sent by email to the heads of the 17 academic health libraries in Canada, via the Association of Faculties of Medicine in Canada Library Group’s email list. To boost participation, the survey was subsequently sent to the Canadian Health Libraries Association email list, with the email directed to supervisors of professional librarians. Respondents were given two weeks to respond. Anonymous survey responses were printed and responses to each question were collated. Numerical responses were tallied. Text responses were reviewed to identify themes, which were assigned colours. Coloured markers were used to highlight themes as they occurred. Numbers of occurrences were tallied for each theme.

Results

Fourteen responses to the survey were returned. Not all respondents answered every question, so the number of results for each question varies from the total number of surveys returned. Questions 1–4 characterized the levels of librarian activity in researching and systematic review searching as a research activity. For most of the respondents, conducting research is a part of the librarians’ contract or job description (Figure 1). All (100%, $n = 14$) of the respondents indicated that librarians at their library participated in teaching systematic review searching and (or) participated in systematic review projects (Figure 2). Sixty-four percent of respondents reported that most or all of their librarians participated in systematic review projects (Figure 3) and 71% indicated that participating in such projects was a normal part of their librarians’ work (Figure 4).

Questions 5–10 and 12 asked about various aspects of the work of librarians as co-authors of systematic reviews. All respondents (100%, $n = 14$) indicated that their librarians communicate with researchers about co-authorship on systematic reviews. The form of communication varies, with verbal negotiation at the first meeting and the writing of co-authorship into grant proposals being the methods used most often (Table 1). Most of the supervisors indicated that librarians reporting to them are acknowledged or listed as co-authors “most of the time” or “all of the time” (Figure 5). In general, when thinking about performance evaluation, pay incrementation, tenure, and promotion, supervisors valued librarian co-authorship more than acknowledgements (Figure 6).

Most of the supervisors viewed library and information studies research authorship as equally valuable or more valuable when compared with co-authorship on systematic reviews (Figure 7). Most (85%) see the demand for syste-

Fig. 1. Is conducting and publishing research a part of the librarians’ contract or job description with your organization?

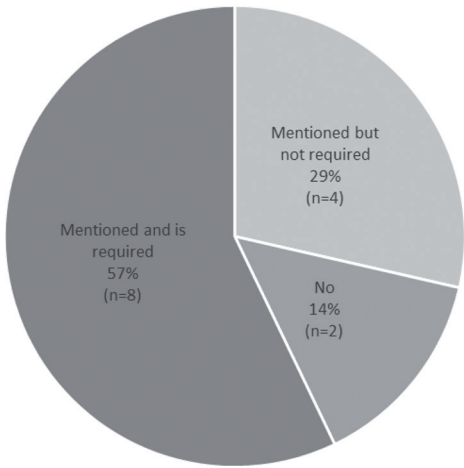
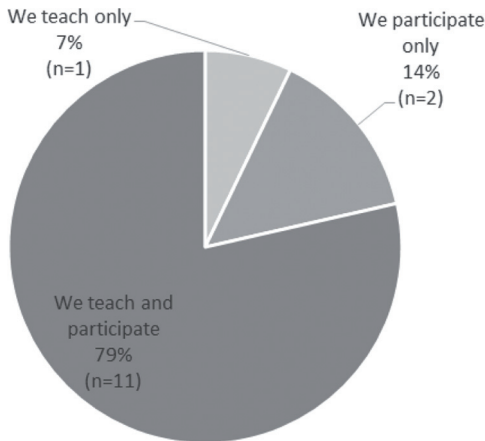


Fig. 2. Do you or your professional librarians participate in teaching systematic review searching or participate in systematic review projects?



matic reviews increasing, whereas 78% predicted that the increase would be rapid (Figure 8). All but one respondent (92%) expected that their librarians would be co-authors on systematic reviews (Figure 9).

Questions 13 through 20 investigated the amount of time and effort librarians are or should be investing in systematic review searches and research projects, as well as the functions performed as part of a systematic review project team. Supervisors were asked to estimate how much time librarians spend on a single systematic review when they are co-authoring, being acknowledged, or given no acknowledgement. Overall, supervisors expected that librarians would spend more time on the systematic review if they were co-authors, less if they were being acknowledged only, and even less if there was to be no mention of their involvement (Figure 10).

Fig. 3. If you or your librarians participate in teaching systematic review searching or participate in systematic review projects, how many of your librarians participate in systematic review projects?

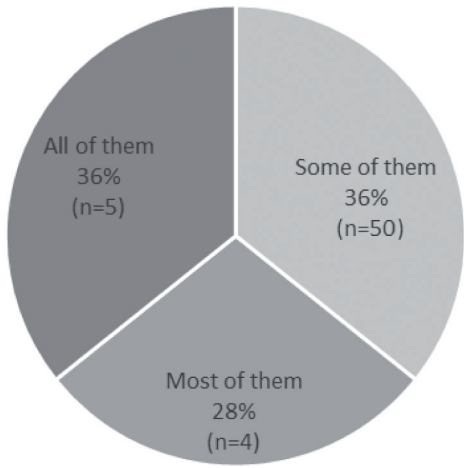


Fig. 4. Is participating in systematic reviews projects part of your librarians’ normal work?

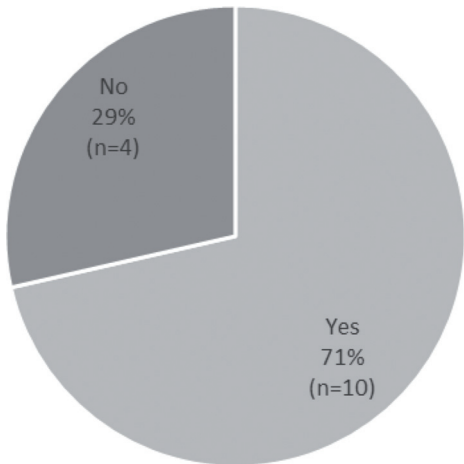


Table 1. If your librarians communicate with researchers about co-authorship on systematic reviews, please explain how this information is communicated with the researcher?

Negotiated verbally at first meeting	12
Written into grant proposal	8
Search protocol form addresses	5
Search policy form addresses	1
Faculty offers acknowledgement or authorship	1

Fig. 5. Are the librarians whom you supervise normally acknowledged or listed as co-authors or for their work on a systematic review?

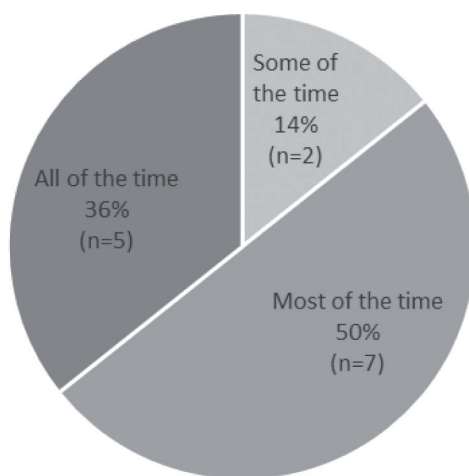
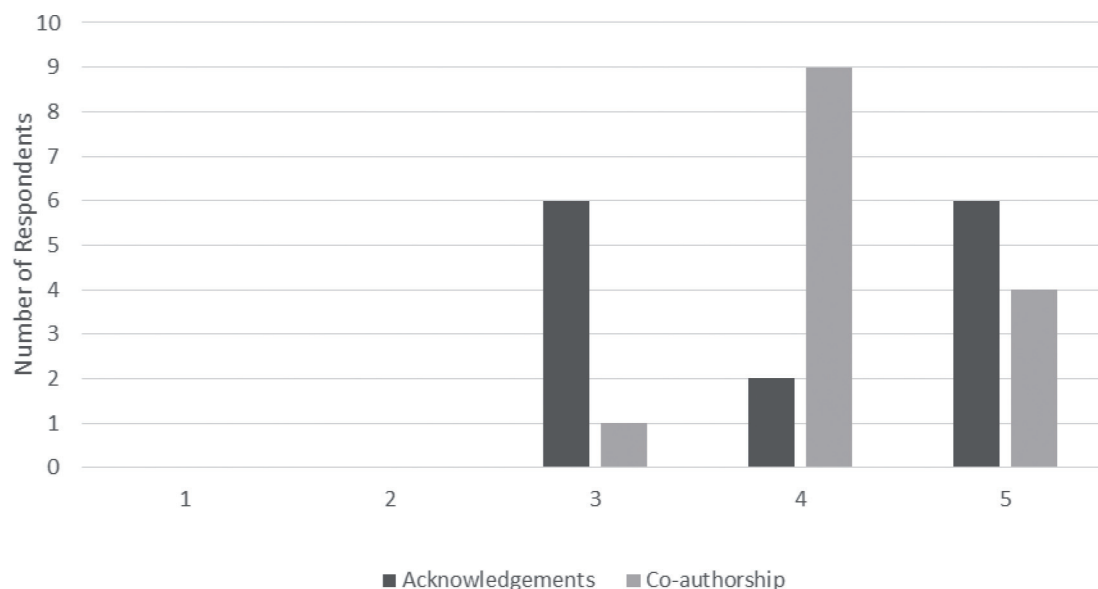


Fig. 6. How much do you, as a supervisor, value acknowledgements or co-authorship on publications with respect to performance evaluation, pay incrementation, and (or) tenure and promotion, with 1 = not at all and 5 = very highly?



When asked how many systematic reviews a librarian should complete in a single year, whether as a co-author or when only being acknowledged, there was little consensus. For co-authored reviews, the range was from 1 to 10, with about half of the supervisors suggesting selecting 2 reviews as reasonable (Figure 11). For reviews in which the librarian was not a co-author, the range was from 1 to 200 (Figure 12).

The supervisors were asked to choose the activities from a list that librarians should be undertaking as part of a research project, first if co-authoring and then if receiving only an acknowledgement. The list of activities was selected from IOM's Standards for Systematic Reviews checklist.

Of the 16 activities listed, supervisors of co-authoring librarians thought that they should be undertaking all of the tasks that are normally associated with the search phase of a systematic review project, beginning with planning the strategy as well as reviewing and approving the final draft (Table 2). For those librarians receiving only an acknowledgement or no recognition, the most frequently cited expectation is that the librarian will plan the search, execute it, export references, and remove duplicates. However, only half of the respondents indicated that the librarian would undertake any tasks in addition to planning the search with the client.

Question 21 asked the supervisors for further comments. The comments received varied greatly. Some of the participants commented on the fact that complexities of systematic review searching made it difficult for them to fit their experiences to the questions asked. For example, one participant commented that in answering the question about number of searches done per year, the answers were based on "participate in," rather than "complete," because many reviews take more than a year to complete. Another noted that "acknowledgement is a mixed bag and doesn't always carry the same resonance as co-authorship in terms

Fig. 7. Librarians contribute to scholarship both in library and information studies (LIS) and as a member of a systematic review team. Do you, as a supervisor, think that authorship on publications in LIS is more or less important for tenure and promotion than co-authorship on systematic reviews?

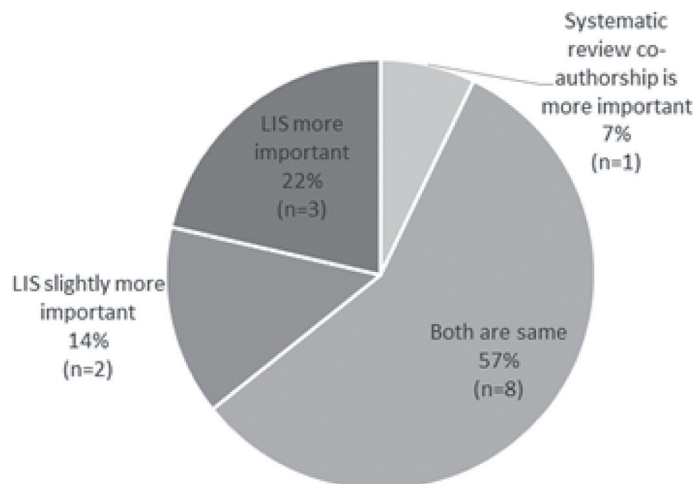
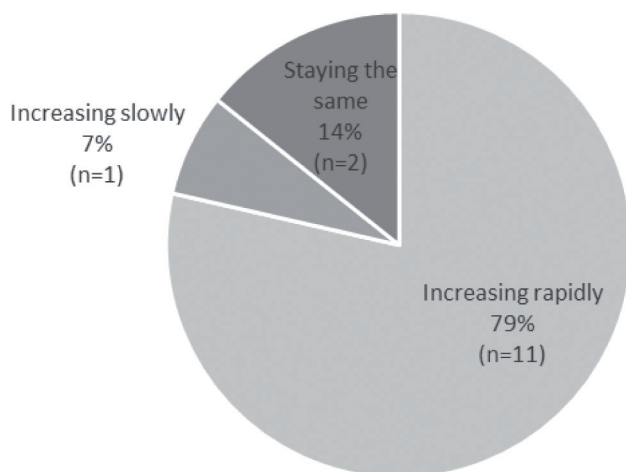


Fig. 8. Do you see the demand for systematic review services to be increasing/decreasing?

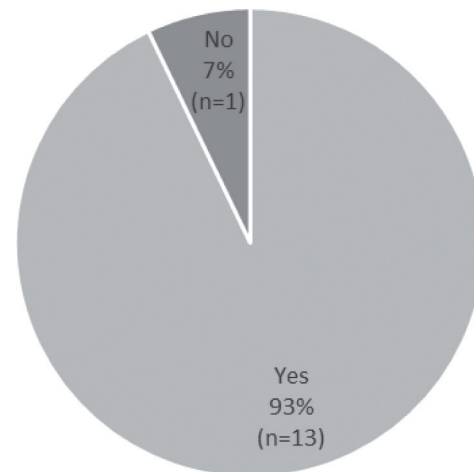


of quality of the final project.” Another commented that the “steps involved in various types of SRs [systematic reviews] could be very variable.” Finally, one suggested that there “should be an international guideline about authorship in SRs.”

Discussion

It is apparent from the responses to this survey that, across Canada, supervisors of academic health librarians expect that their librarians will be involved in systematic reviews and that the demand for reviews is increasing. This finding is consistent with findings from other studies mentioned in this article, as well as with our own experiences and the experiences of our colleagues. This

Fig. 9. Do you expect that your librarians will be co-authors on systematic reviews?



increase in demand may stem either from an increased awareness of the need for librarians as expert searchers and the important role they play in systematic review searching, or it may simply be the result of an increase in the number of systematic reviews being performed by researchers.

Our survey results also reveal a pattern, if not consensus, in the list of tasks that librarians are expected to complete when undertaking a systematic review. This pattern is also consistent with many of the findings of other studies, which also note that librarians should be part of the development of the search strategy, translation of the search across databases, and often some form of management of the citations found in the search [7, 11].

There is little consistency or consensus in our survey results with regard to how supervisors understand what their librarians do for co-authorship, for acknowledgement, or for no formal credit. Some supervisors expect their librarians who are fully involved from defining the project through to writing the search methods to be full authors, whereas supervisors of others who do the same level of work do not necessarily expect them to receive any acknowledgement at all. There are several possible reasons for this variability. For one, it may simply be a matter of supervisors not being comfortable answering for their librarians, particularly since they are likely not with their librarians when they negotiate with faculty on their systematic review involvement. The variance in results might also be the result of supervisors not having detailed knowledge of the extent of the relationships that librarians are able to develop with individual research teams, which may affect the librarians' ability to leverage recognition for their work. The feedback given by the supervisors in the final survey question also points to a potential ambivalence toward being acknowledged, versus being listed as co-author, given the fact that acknowledgements are not always consistently valued. Whatever the reasons for this lack of consensus, it does point to the need for a larger discussion within the profession. It is our hope that this study will stimulate that conversation.

Fig. 10. Estimated average time spent, in hours, by librarians on systematic review searches, depending on level of recognition.

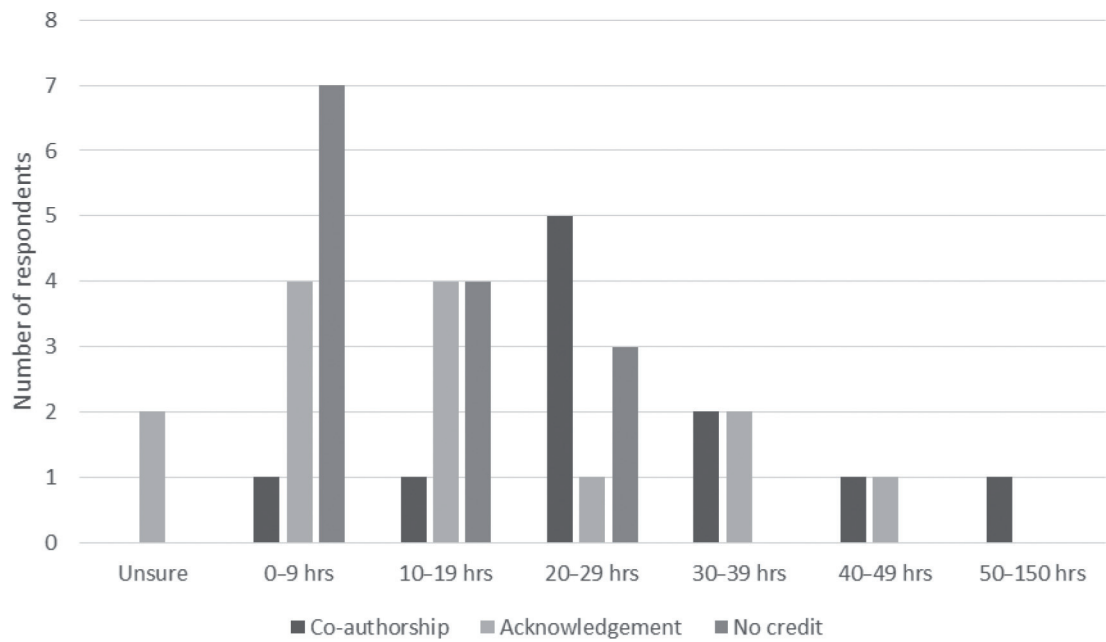
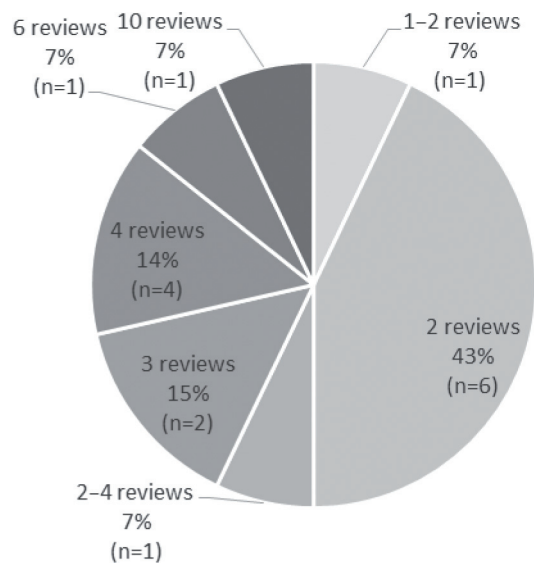


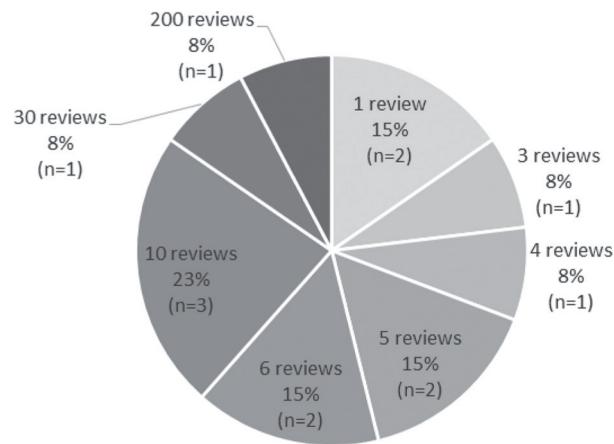
Fig. 11. What is a reasonable number of systematic reviews for a librarian to complete in a single year, as a co-author?



Limitations of this study

There were a few limits to this study. For one, this study is limited by the size of the potential study group. While the response rate of our target group (82%) is high our actual target population was small (17 people). Although we believe that there was an adequate response from our target population, and we feel confident that we can apply our findings in the context of the understanding of supervisors, we do acknowledge that the small overall size of the respondents could limit the applicability of some of the responses to other groups.

Fig. 12. What is a reasonable number of systematic reviews for a librarian to complete in a single year, if they are only receiving an acknowledgement?



Further, we recognize that some of the questions, particularly those in which we asked supervisors to estimate, may have led to some skewing of data and that including a “don’t know” option for more of the questions might have revealed a clearer picture of the knowledge base of the respondents. Also, the numbers recorded by the supervisors may not be an accurate portrayal of the work of their librarians, but rather guesses. Nevertheless, the responses gathered are still useful to gain insight into how supervisors understand the work involved, and will hopefully spark more dialogue on this important topic. Future endeavours to continue this discussion will be more nuanced.

A final limitation to the general applicability of our results is the variation in the extent to which supervisors

Table 2. The Institute of Medicine lists a number of required activities to complete when conducting a systematic review search. What tasks would a librarian typically undertake for a systematic review when being listed as co-author, when receiving an acknowledgement or when receiving no formal credit?*

	Co-author	Acknowledged	No formal credit
Plan search strategy with research team	14	12	12
Have search strategy peer reviewed	10	6	6
Execute search of selected databases	11	7	7
Search for literature by important authors	9	6	5
Execute search for literature cited by eligible studies	11	6	5
Execute search of grey literature databases, clinical trial registries, and other sources of unpublished information about studies	13	5	4
Remove duplicate articles	12	6	5
Hand search selected journals and conference abstracts	4	0	2
Write search methodology for paper	12	2	4
Review and approve final draft	6	1	1
Screen and select studies	2	0	0
Critical appraisal of articles	1	0	0
Provide search strategies as an appendix	1	1	0
Mentor research assistants on methodology	1	1	0
Troubleshoot access to articles via – inter-library loan and citation issues	1	0	0
Contact study sponsors and others to submit unpublished data	1	0	0
Not sure – isn't practiced here	0	1	0
Instruct research team member who is doing the search	0	1	1
Provide training and mentorship on research methods	0	0	1

*Respondents could have multiple answers and could write in alternate answers, so the total number of responses is greater than the total number of respondents.

may influence tenure and promotion decisions. In some academic libraries, supervisors have direct influence, whereas in others supervisors make recommendations to administrators or committees who make the decisions. Whether they have a direct role or not, because supervisors and managers are in more senior administrative positions they are able to influence institutional policies in ways that their teams cannot. Further, many supervisors and managers define which activities are given priority in their own library units. Their perception of the value of systematic review work will influence the level of support that they give to their librarians to do this work. Moreover, their perception of the value of systematic review work is an important insight unto itself, and may also reflect the institutional climate.

Future research

This study has revealed a number of gaps that we intend to examine in future research. One potential direction in which librarians and their supervisors may work could be in the development of guidelines and policies to help librarians negotiate authorship. For librarians to receive appropriate recognition for the intellectual property that they invest in systematic review projects, supervisors must be prepared to support them in this endeavor. Helping librarians negotiate appropriate credit for their work may involve many different tactics, such as communicating to senior library management the value of the intellectual work involved in systematic reviews, drafting work expectations that include systematic review co-authorship, encouraging librarians to discuss authorship and acknowledgements with research teams, developing formalized communications about systematic review co-authorship

to be shared with faculty, and generally working towards making appropriate recognition for librarian contribution standard practice in the workplace. One of the respondents recommended that the ICJME guidelines be adapted for librarians working in systematic review projects. We have begun initial work in this area and will be validating that in future research.

Moreover, it has come to our attention that the process of negotiating authorship with research teams is an uncomfortable task for some librarians. Keeping in mind the role of supervisors and how they may provide support, as well as developing tools and (or) documentation, it is our intention to investigate how to help librarians approach these negotiations more confidently.

Finally we recognize that this study is underpowered in being restricted to supervisors; however, given that the research to this point has focused largely on the perspective of librarians undertaking systematic review searches, our work provides a complementary perspective. Further research on this topic might be expanded to librarian searchers, as well as those who work outside of academic environments.

Conclusion

The purpose of this study was to survey supervisors of Canadian academic health librarians to develop an understanding about the extent and nature of their librarians' involvement in systematic review search projects, to understand how their librarians are currently acknowledged for their work in systematic review searching, and to understand how their work in systematic review searching is valued by their supervisors.

The results of our survey show strong expectations that librarians are involved, and will continue to be involved, in systematic review research projects. The lack of consensus among academic health librarians' supervisors regarding most aspects of librarians' involvement in systematic review projects and the ways in which this work is and should be acknowledged, points to the need for more research on this subject. Our survey is an important step in this direction.

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