ORIGINAL ARTICLE

Landscape of health sciences librarian-mediated search services

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Abstract

Background: Health librarians have traditionally provided mediated searches to support patient care, education and research.

Objectives: This study aims to discover the types of search result formats used by health science libraries, determine current practice among health science libraries (types of requesters served, fees, deduplication, turnaround time and citation manager use) and uncover innovative methods for providing search results.

Methods: An online survey was distributed to the MEDLIB-L, ExpertSearching, MidContinental Chapter of the Medical Library Association and ICON listservs and through direct email to selected Association of Academic Health Sciences Libraries reference and education librarians.

Results: Librarians affiliated with 127 institutions from 11 countries (including the USS) and 36 USS states and territories responded. One hundred and forty-two of the total 150 analysed responses provided information on full-text access, and 81 of those 142 responses (57%) indicated that the institutions' link-resolver links were included in search results provided to the requester. The survey responses provide information on literature search services regarding turnaround time, use of a citation managers, fees and deduplication.

Conclusion: With the developing landscape of citation managers and the tools offered, these data can be used as a benchmark for librarians who are considering evaluating or modifying their search service delivery.

KEYWORDS

libraries, health science; libraries, hospital; libraries, medical; literature searching; mediated searching; surveys; United States of America (USA)

BACKGROUND

Librarian-mediated search services are a vital support to patient care, evidence-based practice and instruction, and basic and clinical research on health science campuses and in hospitals (Farrell & Mason, 2014). The Association of Academic Health Science recognizes the importance of librarian-mediated search services and includes search

request numbers among the essential library activities it tracks.

Several types of librarian-mediated search services exist. This article focuses solely on routine, librarian-mediated search services. The search requester contacts a librarian or library to request assistance searching for a list of articles/ materials addressing a topic. Other librarian-mediated search service models—including clinical medical librarian services offered by librarians who attend various clinical meetings or rounds question answering services in which librarians prepare literature syntheses, and systematic review services which provide the exhaustive searches required for the production of systematic reviews, integrative reviews, and meta-analysis—will not be addressed.

A number of studies have focused on quantifying the impact of routine, librarian-mediated search services. The first of these, King (1987) study concerning the impact of mediated-literature search services provided by eight Chicago area hospital libraries, served as a prototype for studies conducted in other locations, including Rochester, New York, USA (Marshall, 1992), the Midlands area and the SW Thames Region of the UK (Urquhart & Hepworth, 1995), the Northern and Yorkshire region of the United Kingdom (Ashcroft, 1998), Tacoma, Washington, USA (Beals, 2009), Canberra, Australia (Ali, 2000), nine US states and District of Columbia (Bayrer et al., 2014), Regina, Saskatchewan, Canada (Farrell & Mason, 2014), New York City, New York, USA (Gibson et al., 2017), and Ballarat, Australia (Siemensma & Clayworth, 2021). Several of impact studies, including the King study, focused solely on patient care-related literature search requests. Typical findings include three quarters or more (Ali, 2000; King, 1987; Marshall, 1992) of the search requesters stating that patient care would definitely or probably change as a result of the information received and more than one-fifth (Ali, 2000; Farrell & Mason, 2014; King, 1987) stating that they had or would handle some aspect of patient care differently. Most of the more recent impact studies have included non-patient care-related requests. They demonstrate the effect of search services on policy and procedure revision, on research, on teaching, on personal continuing education and continue to show that care-related search requests result in changes in patient care (Gibson et al., 2017; Siemensma & Clayworth, 2021). Not surprisingly, the same types of clinical impact are noted in the earlier and more recent impact studies. These include changes in diagnoses, changes in treatment or diagnostic test ordering decisions, changes in the advice given to patients, reductions in length of hospital stay or avoiding admission altogether, and avoiding adverse effects (Ali, 2000; Bayrer et al., 2014; Farrell & Mason, 2014; King, 1987; Marshall, 1992; Siemensma & Clayworth, 2021). Most impact studies mention that the search services save busy health professionals' time. One hundred per cent of

> **Key Messages**
> 1. Librarian-mediated literature searching continues to be a valued service in health science libraries.
> 2. Librarians utilize a variety of methods to connect their users with full-text access to the literature.
> 3. Product developers need to consider ease of use, intention for use and access to full-text when designing and updating citation management tools.

respondents in the 2021 Siemensma & Clayworth study agreed that the librarian-mediated search service had saved them time, and 66% indicated that the time saved was 4 h or more. Some studies have attempted to calculate savings resulting from saving clinicians' time (Beals, 2009) or reducing some patient's length of stay (Klein et al., 1994).

The impact studies have helped justify the investment of librarian time in provision of routine search services. However, they have not provided any benchmarks for the various aspects of search result delivery. Little information is provided about turnaround time (the one study [Ashcroft, 1998] including a figure concerning timescale for result delivery was only available to the authors of this article through inter-library loan in a form that lacked all figures and tables). A few of the studies of impact mention rare requesters receiving results after their usefulness in the current patient's care had passed (Gibson et al., 2017; Scolaro, 1995) or some requesters never receiving results (Ashcroft, 1998). Siemensma & Clayworh note that, since the advent of end-user searching, requests submitted for librarian-mediated searching have gradually become more complex and required more time to complete. Unfortunately, these investigators do not present their institution's completion time data (Siemensma & Clayworth, 2021). Format of search results is another topic that receives little or no attention in the reports of impact studies. King (1987) did mention that 47% of search requesters specified a desire for a list of references or printout and copies of journal articles pertinent to their case.

Searches for studies outside the boundaries of the 'impact' literature, produce more information about search result delivery parameters. A few studies of individual institution's or individual network's librarian-mediated search services have described the search result delivery format used. A 2005 article describing the Family Physician's Inquiry Network mentioned the PubMed Cubby format (now known as My NCBI Collection format) with full-text links used by one network library and a Word document format used by other member libraries

(Ward et al., 2005). Some of the librarians responding to Lasserre's survey concerning Australian health libraries' search services mentioned delivering full-text or sending instructions for obtaining full-text with the search results (Lasserre, 2011). In 2013, Hinton et al. (2013) described the result format used by Preston Medical Library at the University of Tennessee Graduate School of Medicine as a list of abstracts for relevant articles. The search requester identified the articles they wanted to see, and the full-text versions of selected articles were then retrieved by the librarian and delivered to the requester. Friesen and coauthors' report on their institution's search service mentioned using various result formats depending on the recipient's needs. RefShare (with link-resolver buttons) and Word documents were the predominant formats used. Other formats—EndNote, Reference Manager, text documents or paper copies delivered by mail or pick-up— are also utilized when requested (Friesen et al., 2015). McKeown and coauthors published an evaluation of hospital staff's perceptions concerning their institution's search service in 2017. They noted that one respondent commented that inclusion of links to full-text articles would be preferred (presumably as compared to the instructions for obtaining full-text and a link to request form usually included with search results by the library staff; McKeown et al., 2017).

In 2017, Jill McTavish published a report of her research into Canadian librarians' and library service users' criteria for good search service. Prompt acknowledgement of the receipt of the search request and timely return of results were considered two important aspects of good service. However, McTavish does not provide any information about the time range that was considered 'timely'. McTavish's study does provide more information about other search delivery parameters than any other study identified by our searches. For instance, when interviewed about how they would approach a specific search scenario, some of the librarians said they would search several databases, combine and de-duplicate the results and send the results to the requester in a bibliography format, while others would search a single database and send results directly from that database. Various methods were used to help service users gain access to full-text articles.

Our experience

Our academic health sciences library has offered librarian-mediated search services throughout the last six decades. In 2006, the library licensed RefWorks to serve as a citation manager for our campus. The library selected RefWorks largely because the shared 'folder' feature, RefShare, would allow librarians to deliver de-

duplicated search results containing full-text buttons (in this case open URL link-resolver buttons. For more information on open URL link resolvers see Chisare et al. (2017). Importantly, results in Legacy RefShare format are visible to those with or without RefWorks accounts. Search requests nearly tripled in the years after we began providing results in the RefShare format. The library received 365 search requests during the 12 months prior to licensing RefWorks. After beginning to use RefWork's Refshare to provide search results, the number of search requests received began to increase. During the calendar year that began 21 months after our library licensed RefWorks, we responded to 1009 requests. Positive comments concerning the RefShare format were received from search service users.

In 2016, ProQuest launched New RefWorks (ProQuest Reimagines RefWorks Platform to Streamline the Research and Collaboration Process, 2016). Unfortunately, an individual without a RefWorks account who views a shared 'new RefWorks' folder can only see a partial author list and partial article title for each record. The article abstracts and link-resolver buttons are only available if the RefShare folder recipient logs into a personal new RefWorks account. As only a fraction of our campus', mediated-search service users are interested in using RefWorks, shared 'new RefWorks' folders were useless for routine sharing of search results. For these and other reasons, our library has continued to use Legacy RefWorks with, of course, the fear that it might someday be unavailable. In 2019, we began to look for alternate ways to provide search results that included citations, abstracts and link resolvers.

Objectives

We decided to survey our peers to:

1. get a feeling for the types of search result formats currently used by health science libraries.
2. determine current practice among health science libraries in a variety of areas that might affect search service use, including types of requesters served, fees for service, deduplication efforts made, turnaround time and citation manager use.
3. uncover novel or innovative methods for providing search results that included links to full-text and required minimal librarian time investment.

METHODOLOGY

We used Springshare's LibWizard's survey tool to create an online survey. We asked participants to supply information

regarding their routine search service rather than their services in support of systematic review production. Questions focused on factors that might influence the utilization of search services. These included turnaround time, patron types served, charges for service, deduplication of results and search result format, especially the inclusion of link-resolver links (or other methods of facilitating access). We also included a question about any changes in service utilization that corresponded to format changes. The survey asked participants to provide their institutional type (hospital, university/college or other). We requested, but did not require, that respondents provide their institutional affiliation; we used this information to lump multiple responses from a single institution. We excluded responses that did not specify a routine search service or answered no questions describing their service. An IRB protocol was submitted and received approved exempt status; IRB # 125-19-EX. Refer to Appendix A for the survey sent to the participants.

We recruited participants via the MEDLIB-L, ExpertSearching, Mid-Continental Chapter of the Medical Library Association (MCMLA) and ICON listservs. The MEDLIB-L and ExpertSearching listservs are sponsored by the Medical Library Association (MLA) but open to non-MLA members. Although most listserv members are based in the United States, both listservs have active participants from around the globe. The MCMLA listserv serves members of the Mid-Continental Chapter of the Medical Library Association. MCMLA membership is required to join and participate on the listserv. ICON serves members of Nebraska's ICON Library Consortium. ICON membership is required to join and participate on the listserv, with most, but not all, members are based in Nebraska. Additionally, through direct email, we contacted individual reference or education librarians from the Association of Academic Health Sciences Libraries US-based Libraries (Member Institutions, 2019). A total of 166 individuals participated in the survey.

As mentioned earlier, participants had the option of providing their institution's name for the sole purpose of identifying multiple responses from a single institution.

The survey also asked participants to enter their email addresses if they were willing to be contacted with follow-up questions or wished to receive project results. The survey was sent out on March 31, 2019 and closed on April 30, 2019. Data were exported to a Microsoft Excel spreadsheet, and data analyses were conducted.

FINDINGS

Response number

One hundred and sixty-six total survey responses were received (see Table 1). Two unusable responses were removed from the dataset. Multiple responses from individual institutions were lumped with the original responses from those institutions and this reduced the number of analysed responses by 14. One hundred and fifty responses remained after the 'lumping' step. One hundred and twenty-seven of these 150 responses had a stated institutional affiliation and 23 did not. These are the 150 'analysed responses' addressed by the remainder of this article.

Type of institution served

Respondents were asked to identify the institution they served as either:

- A hospital without rotating students or residents.
- A hospital with rotating students or residents.
- A medical centre including a hospital and one or more health science educational programs.
- A university with a health science education program but with no hospital.
- Other type of institution.

For the purposes of the analyses presented here, the respondents that did not respond to the request to

TABLE 1 Numbers of survey responses, unusable responses, duplicate responses, unaffiliated responses and institutions represented

|	Overall	Hospital without rotating students	Hospital with rotating students	Medical centre	University	Other or no response
Total responses	166	11	71	40	24	20
Unusable responses	2	1	0	0	1	0
Responses lumped with another response	14	0	7	3	2	2
Total responses remaining	150	10	64	37	21	18
responses without affiliation	23	0	12	5	3	4
institutions represented by single or lumped response	127	10	52	32	18	14
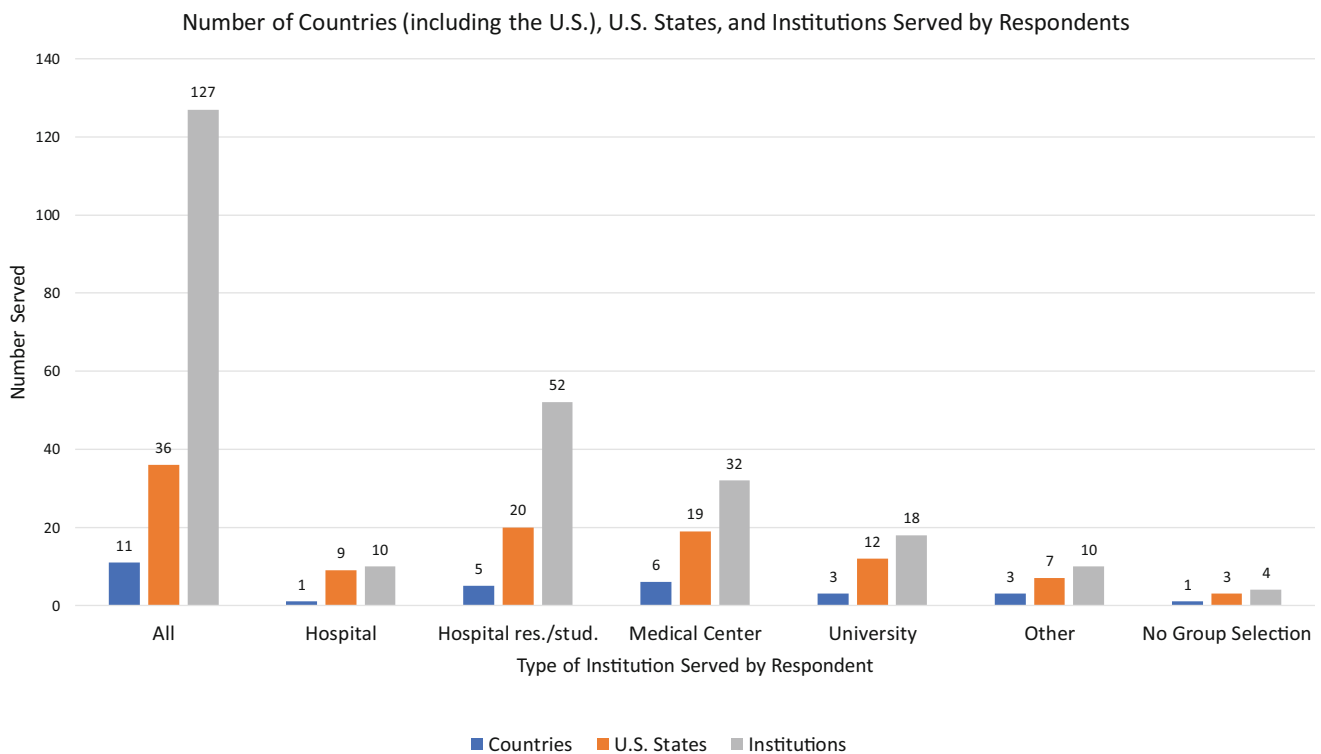
FIGURE 1 Number of countries, US states and territories and Institutions served by respondents [Colour figure can be viewed at wileyonlinelibrary.com]

categorize their institution were grouped with those serving 'other type of institution'. The breakdown of response numbers into the five categories is shown in Table 1.

Geographical distribution of responses

The analysed responses with stated affiliations represented 127 institutions from 11 countries (including the United States) on five continents. Those responses from US institutions represented 36 US states and territories. See Figure 1 for the geographical distribution of responses from different institution types.

Turn-around time

Survey responses showing the time from receipt of a search request to return of completed search results varied widely (see Figure 2). Six respondents indicated that the time to completion was utterly dependent on the request's type, complexity or urgency or on searcher workload and provided no specific time or time range. The same factors were frequently cited as affecting turnaround time in the 132 responses that did include a specific time or time range. Of these 132 responses, over half (57%) stated that searches were completed within two

business days. Another 20 (15%) often completed searches within 2 days but gave a range for completion time that extended beyond 2 days (these time ranges started at <0.5–2 days and extended to 3 to 14 days). Thirty-seven responses (28%) included usual turnaround times of 3 days or more. The longest completion time mentioned was 7 to 60 days. The 'University' group and 'Other or no entry' group tended towards longer turnaround times than the other three groups, but 44% and 47% of the responses in these groups, respectively, still indicated a turnaround time of 2 days or less. Many respondents from institutions serving clinicians noted that searches supporting patient care were completed more quickly.

Groups served and fees

Only one of the analysed responses indicated that the institution's affiliates were charged for search services. The affiliated patron's department paid these charges. The remainder of the survey respondents provided search services to affiliates without charge. A few respondents noted that anyone could use search services, but the great majority served affiliates only. Some respondents serve non-affiliated professionals, and, of these, some charged a fee. Many respondents commented that they provided search training for students rather than sending students
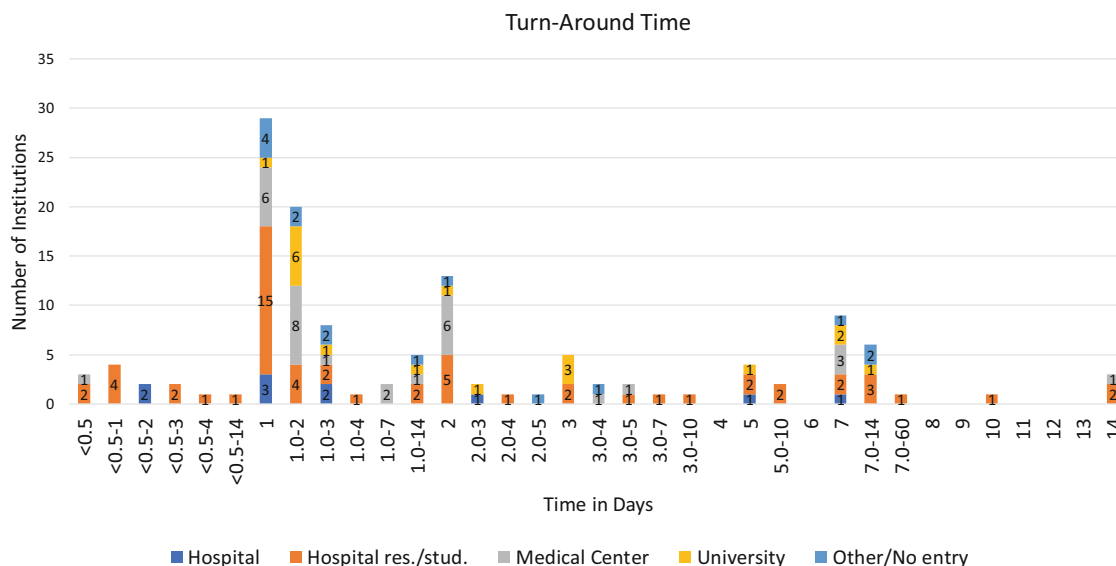
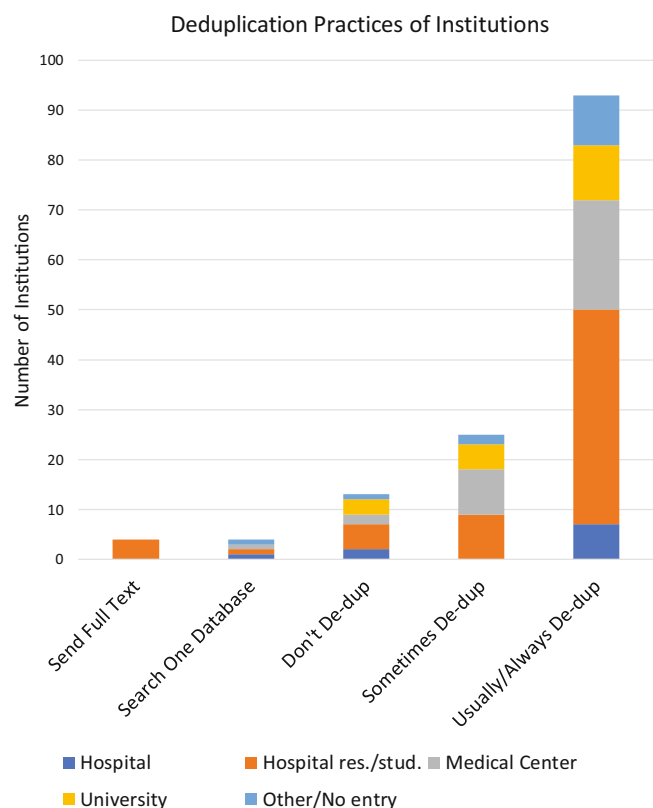**FIGURE 2** Turnaround time [Colour figure can be viewed at wileyonlinelibrary.com]

FIGURE 3 Deduplication practices of Institutions [Colour figure can be viewed at wileyonlinelibrary.com]

search results. The authors' institution offers either or both search service or search training (at the student's discretion) in support of significant student research projects (e.g. thesis work, research electives). Still, it only offers search training or tips to students working on course assignments.

Deduplication of search results

Participants were asked if they removed the duplicate records in search results (deduplication). One hundred and thirty-nine of the 150 analysed responses included information about deduplication of search results (see Figure 3). Ninety-three of the 139 responses containing information (66%) indicated that search results were always de-duplicated. Some of the respondents used citation managers to detect and remove duplicates, some commented that they scanned results to remove duplicates or avoided selecting duplicates. When the 139 responses were analysed by institution type, we found that more than half of responses from each institution type indicated that results were always de-duplicated.

Of the 46 responses from institutions that did not always de-duplicate, 25 indicated that results were sometimes de-duplicated. Eight of the 25 were from respondents or institutions that did not need to de-duplicate because they sent full-text articles or sent results from a single database. Of the 13 that indicated no attempt to de-duplicate, some commented that librarians send a note with search results mentioning the possible inclusion of duplicates.

Facilitation of full-text access

One hundred and forty-two of the 150 analysed responses included information about facilitation of full-text access (see Figure 4). Eighty-one of these 142 responses (57%) indicated that the institutions' link-resolver links were included in search results provided to the requester. A few of these 81 responders provided search results via RefWorks or
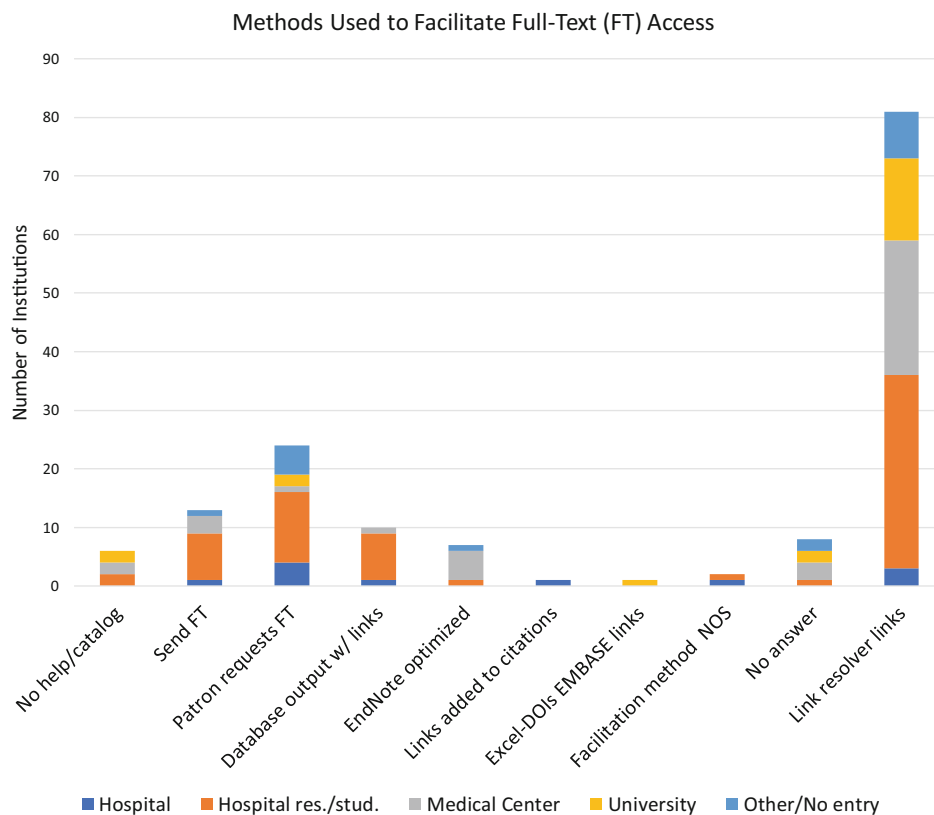
FIGURE 4 Methods used to facilitate full-text FT access. Several analysed responses included information about more than one method of full-text access facilitation. [Colour figure can be viewed at wileyonlinelibrary.com]

F1000 (these tools can be set up to include link-resolver buttons or links). Most of the others used literature database tools to produce an output format that contained their institutions' link-resolver links. Several respondents commented on the effects of link-resolver link inclusion in search results. One institution (the authors' institution) noted a dramatic increase in search requests after the inclusion of link-resolver buttons in search results. Another institution's response noted that users enjoyed being able to download articles quickly. Others noted that, after link-resolver links were included with search results, more articles were retrieved by patrons, requests for document delivery dropped, and the remaining document delivery requests usually had to be addressed by interlibrary loan.

After including link-resolver links, the next most frequently used method for facilitating full-text access was librarian-mediated retrieval of full-text articles. Thirteen analysed responses indicated that full-text articles were sent in response to the search request (rather than database records). Another 23 of the responses indicated that search requesters were asked to highlight or otherwise mark records of interest and send these to the librarian, who then retrieved the needed full-text articles.

A variety of other methods of facilitating full-text access were used less frequently. Seven of the analysed responses indicated that the database output contained links to full-text (e.g. PubMed Central and publisher links). Seven responses mentioned the provision of End-Note libraries optimized for institutional full-text access (the optimization may have included setting link-resolver preference). Two mentioned facilitation of full-text access without providing further information. One of the analysed responses mentioned the provision of Excel files containing DOI links or EMBASE links. One respondent manually adds full-text links to lists of search results.

Several respondents mentioned sending search results in the format preferred by the requester. For instance, EndNote libraries were typically provided to known End-Note users only. Some facilitated full-text access for those patrons who used citation managers by providing citation manager files and optimizing citation managers to facilitate institutional full-text access.

Citation managers available to search service providers

Respondents were asked whether their institution had ever used a citation manager to share search results and, if so, which programs had been used. Forty of the analysed
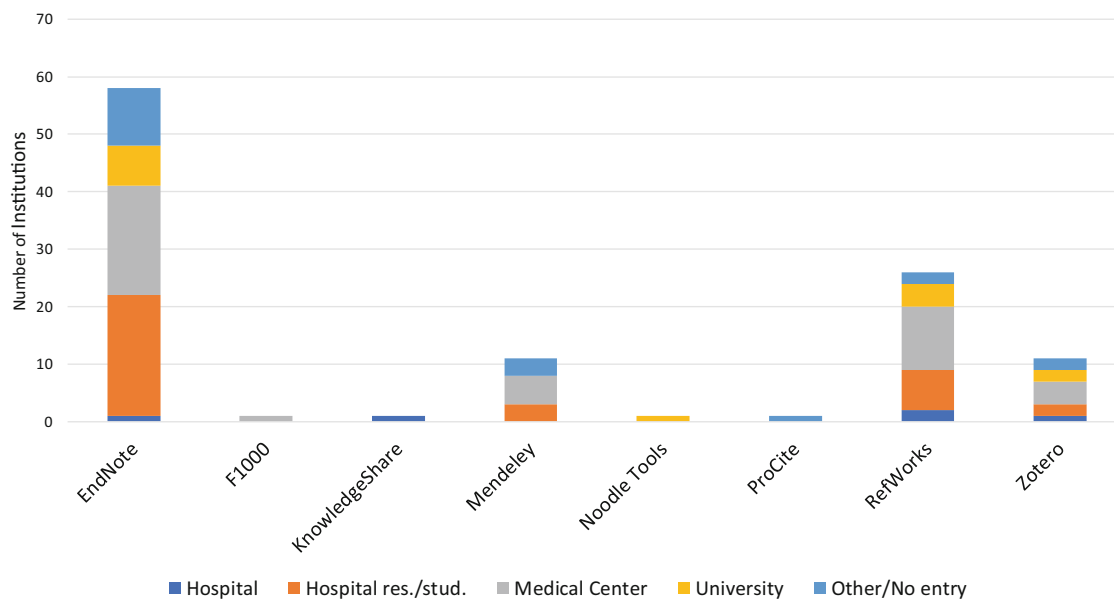
Citation Managers Used by Institutions

FIGURE 5 Citation managers used by institutions [Colour figure can be viewed at wileyonlinelibrary.com]

responses indicated that citation managers had not been used for this purpose. The other 110 responses indicated that a citation manager had been used. Some institutions had used more than one citation manager. Citation managers mentioned, in descending order of rate of use, were: (1) End-Note (58/150 analysed survey responses, 39%), (2) RefWorks (26/150, 17%), (3) Mendeley and Zotero (tied at 11/150, 7%) and (4) F1000, KnowledgeShare, Noodle Tools and ProCite (tied at 1/150, 0.7%). When a citation manager format is used for search results, the format is often dependent on the patron's request. Some institutions provided search results in Word documents along with citation manager files/links. Two institutions from the survey noted that provision of search results in citation manager format increased requests for citation manager training. One noted that one-on-one citation manager training sessions led to requests for departmental funding of the program (Figure 5).

DISCUSSION

The survey results reported here provide the most far-reaching description of librarian-mediated literature search service delivery characteristics available in the literature. We cannot claim that our results are representative of the service provided by all health sciences libraries in the pre-COVID-19 period, but we were gratified by the breadth of the response. US-based respondents were from 36 states or territories, and although we made no real effort to recruit institutions outside the United States, responses from 11 countries were received. The

FIGURE 6 An example record formatted using the custom output style created for Zotero [Colour figure can be viewed at wileyonlinelibrary.com]

international response speaks to the reach of the MEDLIB-L and the Expertsearching listservs. A range of different institutions were also represented, including 32 medical centres that included both a hospital and one or more health science education programs and 18 universities with a health science education program but no hospital. We were gratified to find that librarians in such a wide range of settings and locations were interested enough in this topic to respond to the survey.

Our search for existing literature that addressed our survey questions identified few relevant studies. The most recent article mentioning search result format was McKeown's and McTavish's, 2017 studies. McKeown evaluated a single institution's search service. McTavish

reported on the opinions of Canadian librarians and library users concerning the criteria for good search service. Her results identify timely service as one quality of a good search while failing to define 'timely'. Other aspects of search result delivery provided by McKeown's interviewees varied considerably. Consequently, we had few preconceptions about likely survey results, but expected considerable variation in practice.

Although responses to some survey questions did vary widely, responses concerning charges, deduplication of results and turnaround time were more homogeneous than we had expected. All but one respondent provided free service to affiliated individuals. The one respondent that charged affiliates billed the requester's department. In response to the question concerning deduplication, over three quarters of respondents said they either sent full-text only (all of these were hospital libraries with residents or students) or de-duplicated results even if this meant eyeballing results for duplicates. Responses concerning turnaround time were more varied, but over half of respondents did provide results within 1 or 2 days of receiving a request. It is possible that those choosing to respond to a survey concerning search services may value and enjoy providing that service more than non-respondents. This might skew our survey results towards institutions that do not charge for services, put more effort into formatting results and deliver results quickly.

We asked which citation managers were available and used, at least occasionally, to format search results at the respondents' institutions. Interestingly EndNote, one of the more expensive programs, was available to and used by nearly 40%, RefWorks by about 17%, and the various free programs (Zotero, Mendeley, F1000 and Noodle Tools) were used by 7% or less. McMinn (2011) examined the level of service and support, and the comparison of features, for EndNote and RefWorks within Association Research Libraries (McMinn, 2011). Our survey results seemed to align with those of McMinn found in 2011, when most libraries offered support or service for either EndNote or RefWorks.

We were interested in any approach used by librarians to facilitate full-text access. We did not ask whether the respondents had a standard format for search result provision. Consequently, we can only provide information about the range of approaches used to facilitate full-text access. Over half of respondents indicated that they sent search results in a format that included link-resolver links or buttons. A few provided search results via RefShare/RefWorks or F1000 (tools that can be set to include link-resolver buttons or links). Most of the others used literature database tools to produce an output format that contained their institutions' link-resolver links (e.g. PubMed email with outside tool buttons). None of

the methods for facilitating full-text access that were identified by the survey (other than provision of Legacy RefShare links, the method we were already using) met our need for a simple, quick method to provide results that included links without requiring search service users to create a citation manager account or install a citation manager. While working on this survey project, we were continually looking for new, search result formatting methods. We wanted to be ready to replace Legacy RefShare. We also wanted to serve better our library's new users, affiliates of the two local hospitals that had newly established contractual agreements with our library. Our institution and each of these two hospitals use different link resolvers. Some of our institution's affiliates are also affiliated with these hospitals so we wanted to provide search results with multiple link-resolver links. We also wanted to provide a 'Search Google Scholar for Article Title' link in each record to simplify the acquisition of full-text articles that had been posted online by their authors.

We eventually developed two distinct processes capable of producing search result lists with the needed hyperlinks (see https://unmc.libguides.com/c.php?g=628085&p=6925898). Each of these processes takes less than 2 min and can be completed using freely available tools. Each uses a custom output style to format search results that have been imported into a citation manager. Our literature search service team favours the newer process. It is simpler and produces a more attractive product. The librarian uses the custom output style and the citation manager's 'create bibliography' function to convert records stored in the citation manager into the HTML code for a formatted search result list. The librarian then copies the HTML code, pastes it into an interface capable of converting HTML to readable text, copies the resulting text (with embedded links) and pastes that text into a Word document or email. The search result list produced by this process contains numbered records, each of which contains citation information, abstract, one or more "GetIt@____" link-resolver links, and a "Search Google Scholar for Article Title" link (Figure 6).

As mentioned previously, the tools needed to format search results in this way are freely available. We have developed the required custom output styles for Zotero and Mendeley, freely available citation managers, and for Legacy RefWorks (a licensed citation manager). These custom output styles are publicly available at https://unmc.libguides.com/c.php?g=628085&p=6925898.

The styles can be easily edited to meet the needs of other libraries by following instructions that are also available on the linked webpage. The custom styles produce HTML code for a search result list. A variety of tools can be used to convert HTML code to readable text with

embedded links. The challenge is finding a freely available tool that will handle hundreds of pages of HTML code. Pressbooks.com is one such tool and is available worldwide. Librarians can register for a free account, create a 'test' book, open a chapter for editing, click on the 'text' tab, paste in the HTML code, switch to the 'Visual' tab, select all, copy and paste the copied material into an email or Word document.

Limitations

The survey relied on self-selected respondents, and those interested in mediated literature searching and enjoy providing the service may have been the only ones who replied. The responses received in this survey do not represent the entirety of medical librarianship. This research study did not investigate outside of routine search service, such as systematic review searching, and primarily focused on facilitated full-text access. Additionally, clarification on questions were sometimes needed by responders.

CONCLUSION

Our survey data provide a unique picture of the state of search services in the United States (and to some extent internationally) during the year before COVID-19 hit the United States. The data will serve as a benchmark for librarians as they evaluate their search service delivery. With the changing landscape of citation management tools provided and the variety of its services (such as shared folders, deduplication and access to full-text), librarians need to be aware of the available options they can utilize. Staying up to date on the number of options and knowing how other libraries are utilizing these options can help librarians and library administrators make informed decisions when it comes to starting or modifying a literature search service.

As we examined our options and how we best serve our users, we developed a new method for using citation manager results. We create Word documents with open URL resolver links, a technique that can be easily customized for an institution's link resolver and handle links for more than one institution's link resolver. This method has helped us as we have begun to serve other local hospitals. For future research, it would be interesting to conduct a similar survey to study any changes in search service occurring during and following the COVID-19 pandemic.

CONFLICT OF INTEREST
Danielle M. Westmark, Teresa L. Hartman and Cynthia M. Schmidt declare that they have no conflict of interest.

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APPENDIX A

A.1 | Survey

1. Which of the following best describes the library where you work?

a. Primary library for a university medical centre that provides support for university and hospital administration, as well as academic and clinical faculty, staff and students.

b. University or college library that provides support for students and faculty in one or a few health science education programs.

c. Hospital library that provides support for hospital administration, clinical staff and rotating students and residents.

d. Hospital library that provides support for hospital administration, clinical staff without rotating students and residents.

e. Other library that provides support for health science students or faculty or clinical personnel.

2. Does your library offer a librarian-mediated search service?

   Yes
   No

   If no, please scroll to the bottom and click the 'submit' button.

   Please, answer the following questions concerning your routine, librarian-mediated search service. We are not asking about searches performed in support of systematic review teams or searches performed as part of a consumer/patient information service.

3. What is the usual turnaround time between receipt of a request and return of results to the search requester?
4. Who can use your service (students, clinical staff, administrators, faculty, unaffiliated professionals, patients, the general public)?
5. Do you charge for your service? [mult. Answer].

   Yes
   No

   Comments:
   The remaining questions deal with the format/s in which your library delivers the results of librarian-mediated searches.

6. When multiple databases are searched, do you deduplicate the search results before sending them to the search requester?
7. Does the search result format facilitate full-text access?

a. a link-resolver link or button is included in each record.
b. other method of facilitated access is used.

8. If you selected 'other', please describe the method used to facilitate full-text access:

9. Has your library ever used a citation management program to share search results with search requesters?

    Yes
    No

10. If you answered no to question 9, what search result format do you use:

11. If you answered yes to question 9, which programs has your library used?

a. EndNote.
b. Mendeley.
c. ProCite.
d. Reference Manager.
e. RefWorks/RefShare.
f. Zotero.
g. other_____.

12. Have you ever seen a change in the search request numbers your library receives in association with a change in search result delivery format? If so, please describe the change in format and associated change in request numbers.

13. May we contact you for further information/clarification? If so, please provide your email address. We will be happy to share survey findings with those that provide contact information.

14. Please provide the name of your library so that we can group multiple responses from a single library when analysing survey data. We may wish to mention the names of libraries with innovative search result formats but will not do so without obtaining permission from a survey respondent from that library.