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Systematic Review Research Guides and Support Services in Academic Libraries in the US: A Content Analysis of Resources and Services in 2023

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Résumé de l'article

Objective – The purpose of this research project was to examine the state of library research guides supporting systematic reviews in the United States as well as services offered by the libraries of these academic institutions. This paper highlights the informational background, internal and external educational resources, informational and educational tools, and support services offered throughout the stages of a systematic review.

Methods – The methodology centered on a content analysis review of systematic review library research guides currently available in 2023. An incognito search in Google as well as hand searching were used to identify the relevant research guides. Keywords searched included: academic library systematic review research guide.

Results – The analysis of 87 systematic review library research guides published in the United States showed that they vary in terms of resources and tools shared, depth of each stage, and support services provided. Results showed higher levels of information and informational tools shared compared to internal and external education and educational tools. Findings included high coverage of the introductory, planning, guidelines and reporting standards, conducting searches, and reference management stages. Support services offered fell into three potential categories: consultation and training; acknowledgement; and collaboration and co-authorship. The most referenced systematic review software tools and resources varied from subscription-based tools (e.g., Covidence and DistillerSR) to open access tools (e.g., Rayyan and abstrackr).

Conclusion – A systematic review library research guide is not the type of research guide that you can create and forget about. Librarians should consider the resources, whether educational or informational, and the depth of coverage when developing or updating systematic review research guides or support services. Maintaining a systematic review research guide and support service requires continual training and maintaining familiarity with all resources and tools linked in the research guide.

Evidence Based Library and Information Practice

Research Article

Systematic Review Research Guides and Support Services in Academic Libraries in the US: A Content Analysis of Resources and Services in 2023

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Abstract

Objective – The purpose of this research project was to examine the state of library research guides supporting systematic reviews in the United States as well as services offered by the libraries of these academic institutions. This paper highlights the informational background, internal and external educational resources, informational and educational tools, and support services offered throughout the stages of a systematic review.

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Conclusion – A systematic review library research guide is not the type of research guide that you can create and forget about. Librarians should consider the resources, whether educational or informational, and the depth of coverage when developing or updating systematic review research guides or support services. Maintaining a systematic review research guide and support service requires continual training and maintaining familiarity with all resources and tools linked in the research guide.

Introduction

Systematic reviews use explicit methods to combine information from multiple studies while minimizing bias and highlighting the quality of included studies to produce a reliable, reproducible summary that informs decision making, e.g., how effective a certain drug treatment might be (Cochrane, 2020). Tsafnat et al. (2014) identified 15 methodical steps that systematic reviews tend to follow: formulate the review question, find previous systematic reviews, write the protocol, devise the search strategy, search, deduplicate search results, screen abstracts, obtain full-text, screen full-text, snowball, extract data, synthesize data, re-check literature, meta analyze, and write up the review. Of these steps, academic librarians can support searching for existing systematic reviews and developing research questions and objective, reproducible search strategies (preparation), finding relevant citations and deduplicating citations (retrieval), and writing portions, specifically methodology, of the final report (write-up). Interest in systematic reviews has been growing since the 1980s (Chalmers & Fox, 2016). Hoffmann et al. (2021) calculated a "20-fold increase in the number of SRs indexed" between 2000 and 2019 (p. 1). With this increase in the number of systematic reviews published per year, it is unsurprising that academic librarians have and are developing and maintaining systematic review research guides and systematic review support services to meet the current needs of researchers interested in publishing systematic reviews.

Literature Review

Several researchers have demonstrated a positive association between librarians or search specialists as members of systematic review teams and improved search quality (Koffel, 2015; Li et al., 2014; Meert et al., 2016; Rethlefsen et al., 2015). Authors of many published studies have focused on the roles and support that health science librarians contribute to systematic review teams. Beverley et al. (2003) identified the transitioning role of information professionals in the systematic review process as "quality literature filterers, critical appraisers, educators, disseminators, and even change managers" (p. 65). Rethlefsen et al. (2015) demonstrated significantly better reported search strategies and search documentation in systematic reviews with a librarian or information specialist identified as a co-author. Spencer and Eldredge (2018) identified the central roles librarians support on systematic review teams, e.g., searching, source selection, and teaching, as well as less documented roles. A less documented role included supporting "formalized systematic review services" (Spencer & Eldredge, 2018, p. 50). Going forward, the "role of librarian as expert searcher may be evolving into the role of librarian as systematic

review automation expert" (Laynor, 2022, p. 104). Early testing of ChatGPT's effectiveness at creating Boolean queries for systematic reviews has noted ChatGPT's inaccurate development of medical subject heading (MeSH) terms and "high variability in query effectiveness across multiple requests" (Wang et al., 2023, p. 14). Since much of the research confirmed the importance of librarians in systematic review processes, it is no surprise that they create research guides to support their work and the people with whom they work.

In addition to the extensive knowledge required, systematic reviews are also time-consuming regarding searching. Bullers et al. (2018) calculated medical librarians spent an average of 26.9 hours per project (median of 18.5 hours) on systematic reviews. These researchers determined librarians spent considerable time on search strategy development, translation, and writing. When surveyed, Canadian university health science librarians identified lack of time and insufficient training as barriers to their ability to support systematic reviews (Murphy & Boden, 2015). As systematic reviews grow more popular in other fields, librarians that serve other disciplines are faced with similar challenges. Toews (2019) investigated the roles of veterinary librarians at universities and colleges and found library policies, insufficient training, and limited time as barriers to participation in systematic reviews. Lackey et al. (2019) presented their own case of their efforts to develop and launch a for-fee systematic review core in their library and in the process became "…fully integrated into the campus research infrastructure" (p. 591). These researchers maintained accurate data of time spent working on projects and concluded the for-fee service increased demand for and their ability to support systematic review services. These knowledge and time requirements inform the types of systematic review support services that can or should be offered by a health science librarian.

Academic librarians use research guides to share library resources and services. With a focus on pedagogical research guide design, Stone et al. (2018) determined that organizing resources around the how and why of the research process in comparison to a pathfinder design enhanced student learning. Bergstrom-Lynch (2019) developed a working set of best practices for creating both user-friendly and learner-friendly research guides and concluded that a more effective instructional learning-centred research guide could be developed by focusing on measurable learning objectives. Data from Lee et al. (2021) suggested that "library guides on systematic reviews currently serve as information repositories rather than teaching tools" (p. 73).

One question that needs to be asked, however, is which tools, resources, and services are being highlighted. This research provides insight into the current state of research guides, noting information they include and exclude on the research guides. Highlights include features that may not seem obvious as well as consideration for what type of service, if any, could be provided by academic librarians in support of systematic review projects. As a result, this content analysis can aid the efforts of librarians developing or updating systematic review research guides and services at their own institutions.

Aims

In this content analysis, I surveyed systematic review library research guides and summarized the tools, resources, and services identified or provided by academic libraries in the United States in support of the systematic review process. The project was borne of this researcher's need to develop a systematic review research guide and support service. Initially unsure of how to approach the topic, I developed this project to minimize some unknown answers and potential biases during the research guide and service development phase. The aim of this project was not to critique current systematic review research guides or make decisions for librarians creating systematic review research guides or developing a systematic

review support service but to highlight the benefits of different considerations illuminated in the findings of this study and this author's experience in developing a systematic review research guide and corresponding support service. The following questions guided the survey of systematic review library research guides and services:

RQ1: Which tools and resources are health science librarians sharing in support of systematic reviews?
RQ2: How much and to what extent are health science librarians covering the stages of a systematic review?
RQ3: What services are librarians offering in support of systematic reviews?
RQ4: What decisions might librarians need to consider when developing systematic review research guides?

Methods

A content analysis method was selected to complete this study. According to White and Marsh (2006), "content analysis is a highly flexible research method that has been widely used in library and information science (LIS) studies with varying research goals and objectives" (p. 22). The benefits of content analysis include flexibility of research design, qualitative and quantitative analyses, and that a content analysis is considered "unobtrusive, unstructured, and context sensitive" (Harwood & Garry, 2003, p. 493). Kim and Kuljis (2010) "…found that applying content analysis to Web-based content is a relatively easy process that allows researchers to perform and prepare data at their convenience and to avoid lengthy ethics approval procedures" (p. 374). This work built on that by Lee et al. (2021), whose methods were informed by Yoon and Schultz (2017). Yoon and Shultz developed a system to analyze academic libraries' websites regarding research data management services. Lee et al. conducted a content analysis of 18 systematic review library guides from English-speaking institutions throughout the world and found heavily informational systematic review guides with opportunity to improve the instructional and skills-focused content.

Sample

An incognito Google search was performed on 3 March 2023. There were approximately 285,000,000 results. Reviewing was considered completed when ten results in a row were out of scope of the eligibility criteria. This occurred at exactly the 200th result. This initial search of (academic library systematic review research guide) identified 151 results that were reviewed for inclusion eligibility. A record was kept of the referrals from each systematic review research guide to others. If these referred research guides were not yet listed in the initial results and met the inclusion criteria, they were added to the list. The remaining four results were located by hand searching using this process. Data extraction occurred from 6 March to 22 March 2023. After 22 March 2023, no additional research guides were added to the list and data collection was considered finalized. The data collection of Carnegie Classifications (American Council on Education, 2024) occurred during this same period and concluded on 22 March 2023.

To be eligible for inclusion in this study, research guides had to be produced by academic libraries located within the United States with a focus on systematic reviews. If a research guide only focused on a narrative literature review, not a systematic review, it was excluded. Only one research guide per university was counted. If multiple were available, the research guide serving the most advanced students (e.g., graduate students) or faculty with the most in-depth, thorough information was selected as the sample from that institution. Research guides geared toward the health sciences were selected if there

were multiple research guides serving multiple subjects at the same in-depth level. Only research guides written in English and published by academic institutions in the United States were included.

A total of 155 systematic review research guides were reviewed for this study (Figure 1). An Excel table including introductory, planning phase, guidelines and reporting standards, reference management, screening, data extraction, critical analysis was used to synthesize the articles. Of the 155 research guides screened for eligibility, 82 were found during the initial search and five were further included during hand searching. A total of 87 research guides are included in this review. Citations were managed in Zotero.

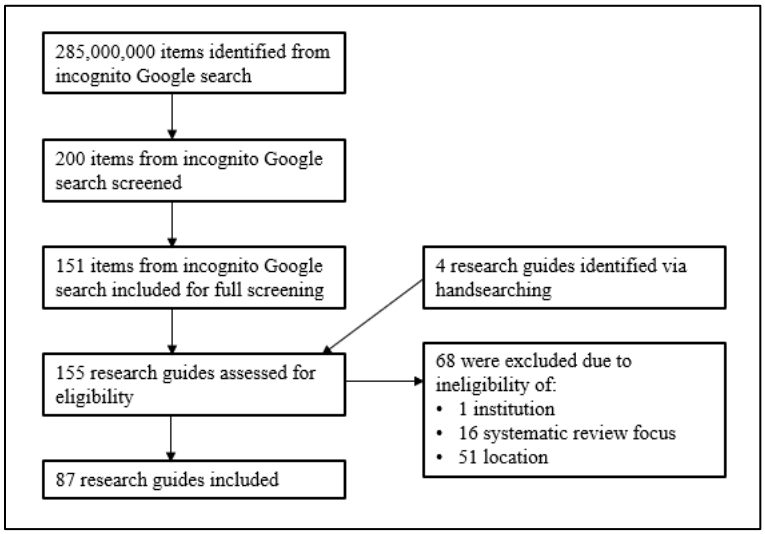

Figure 1
Flow diagram.

Data Collection

The methods used in this review were informed by the work of Lee et al. (2021), whose work was informed by Yoon and Schultz (2017). The categories of content analysis developed by Lee et al. included education (internal), education (external), information, service, tool (educational), and tool (informational) and were used as a guide to notate presence or absence of each item, not the number of each item. Each guide was reviewed for the absence or presence of the above-listed categories. For example, the presence of informational tools was noted, but not that there were two or four tools on a given guide. Individual tools, resources, and services were noted in an in-depth review of the stages of a systematic review. The stages of review collected were informed by the work of Tsafnat et al. (2014) and the work of Lee et al. In-depth data collected were assigned to stages listed in Table 1. The category labeled "Guidelines and Reporting Standards" was also used to include dissemination of a published work due to potential requirements of specific standards for publication. Additional data collected for each guide included any referrals from other research guides, the geographic location, date updated, public or private status, Carnegie Classification status, and levels of services provided, if applicable (Table 2).

Table 1
Description of Categories by Stage

Stage	**Description**
Introductory	Definitions, examples, other types of reviews
Planning Phase	Time and team requirements, question development including question frameworks and eligibility criteria, protocol registration
Guidelines and Reporting Standards	Examples of either, and documentation of search and results in preparation for dissemination of work
Conducting Searches	Developing search strategies, links to databases and grey literature, saving search strategies
Reference Management	Examples related to deduplicating search results, finding full-text, management of resources
Screening	Software including potential cost
Critical Appraisal	Including risk of bias, quality of reporting, tools
Data Extraction	Examples and resources

Table 2
Data Collection Template

General Information (Text Input)	Referred to by (name of institutions)
	Link
	Name of institution
	Location
	Last updated
	Private/public institution
	Carnegie classification
Types of Information (Presence or Absence)	Education - internal
	Education - external
	Information
	Service
	Tool - educational
	Tool - information
Tiers of Service (Text Input)	Consultation and training; acknowledgement; collaboration and co-authorship
Specific Resources (e.g., names of tools) Related to the Stages of Systematic Reviews (Text Input)	Introductory
	Planning phase
	Guidelines and reporting standards
	Conducting searches
	Reference management
	Screening
	Critical appraisal
	Data extraction

Results

A total of 87 research guides met the inclusion criteria and were included in this review. Of the 155 systematic review library research guides appraised in this study, 68 were excluded for eligibility criteria (1 not a university, 16 did not cover systematic reviews, 51 located outside of the United States). The 87 research guides included in this study represented locations across the entire United States (Central Plains – 5; Mid Atlantic – 12; Midwest – 17; North Atlantic –14; Pacific Northwest – 1; Rocky Mountains – 2; South Central – 8; Southeast – 17, West Coast – 11), but leaned heavily toward R1 Carnegie designated institutions (64; R2 – 11; special focus 5; without designation – 7) and public academic institutions (61; 26 private, nonprofit academic institutions). As a group, these guides were regularly updated with 55 guides (63.2%) most recently updated in 2023 (21 in 2022; 2 in 2021; 9 without a date). Some research guides also directed users to other systematic review research guides outside of their institutions. The three most referenced research guides were created by Cornell University, University of Michigan, and University of North Carolina Chapel Hill. Of the 87 research guides reviewed, there were 10 guides (11.5%) that covered multiple areas. The subject area focus of the research guides included health science and biomedical (68), education (2), engineering (2), social science (8), agriculture (4), business/economics (4), and no subject area defined (19).

Each guide was reviewed for the absence or presence of the following types of content: education (internal), education (external), information, service, tool (educational), and tool (informational) (Figure 2). In-depth information was collected for each stage. All but one research guide (98.9%) provided information, but an informational listing of tools was more common than an educational guide to the tools. Research guides were coded for providing educational information for a tool (45; 51.7%), providing information about a tool (1; 1.1%), or both (41; 47.1%). Additionally, external education was slightly more common than internal education. Research guides provided either internal education (18; 20.7%), external education (36; 41.4%), or both internal and external education (33; 37.9%)

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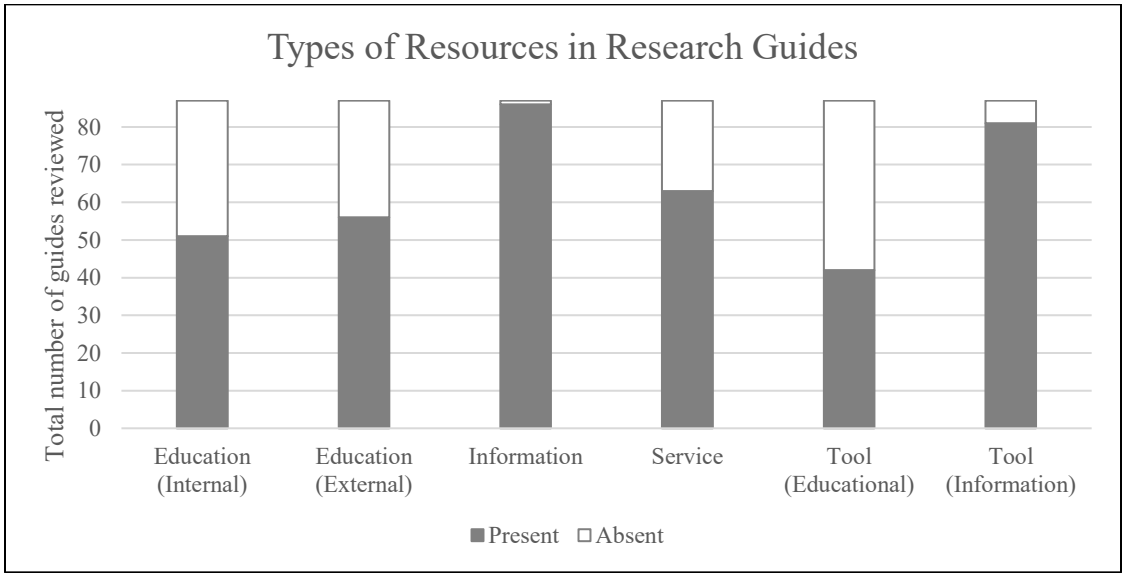

Figure 2
Types of content resources present in reviewed research guides.

In-depth detailed data were collected for each stage (Introductory, Planning, Guidelines and Reporting Standards, Conducting Searches, Reference Management, Screening, Critical Appraisal, and Data

Extraction) and support services offered. After this in-depth data collection, each guide was evaluated for the comparative coverage level at each stage and noted as maximal, average, or minimal in comparison to the other guides reviewed (Figure 3). Minimal coverage was defined as one to two items, components, educational or informational tools or resources provided. Fair coverage was defined as two to four items. Maximal coverage was defined as five or more items. None was defined as no coverage at all. Unsurprisingly, the most well covered stages were those that required library resources or could benefit from librarian assistance, e.g., conducting searches, and the least acknowledged stages included critical appraisal and data extraction, two stages of evidence synthesis that typically require clinical or topical expertise.

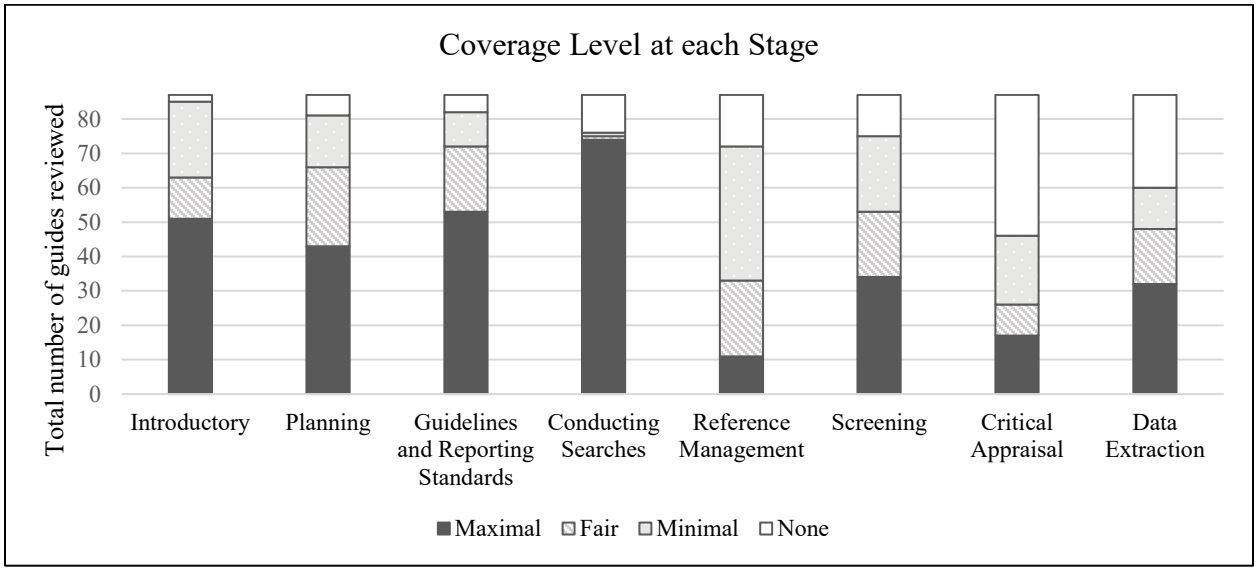

Figure 3
Coverage level at each stage.

Of the 87 reviewed research guides, all 87 (100%) included "introductory" type of information. The most referred to styles of reviews included the following: systematic reviews, meta-analyses, scoping reviews, rapid reviews, and narrative reviews. The research guides that covered the topic in greater detail included the following: critical reviews, mapping reviews/systematic map, mixed studies reviews/mixed methods review, overviews, qualitative systematic reviews/qualitative evidence synthesis, state-of-the-art reviews, systematic search and reviews, systematized reviews, and umbrella reviews. The most referenced source of information was Grant and Booth (2009) and the "Review Methodologies Decision Tree" by Cornell University Library (2023).

During the planning phase, 27 research guides (31.0%) made mention of the concept of using the question framework and refining a research question. Of the 87 research guides reviewed, 57 (65.5%) referred to timeline and team building. The timelines outlined lasted on average between 12-18 months. The most suggested teams included typically three or more team members, including the principal investigator, context expert, two reviewers or screeners, and an operations/project manager. Protocol registration was included in 41 research guides (47.1%). The most referred to sources during the planning phase included Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), International Prospective Register of Systematic Reviews (PROSPERO), and Open Science Framework (OSF). Although

PRISMA is not used to register a protocol, it was highlighted as a source to support protocol development and reporting standards. Data extraction was coded for PRISMA but not the specific extensions.

Of the 87 research guides surveyed, 83 research guides (85,4%) included information on available standards and guidelines. The most referenced guidelines and standards included the following: PRISMA, Cochrane, PROSPERO, OSF, JBI (formerly the Joanna Briggs Institute), Campbell Collaboration, Institute of Medicine (IOM), Agency for Healthcare Research and Quality Systematic Review Data Repository (AHRQ SRDR), and Enhancing the QUAlity and Transparency of Health Research (Equator) Network. PROSPERO and OSF are not official standards or guidelines, but they are commonly used tools for protocol registration, which is a common step in official standards and guidelines. When included, PROSPERO and OSF were acknowledged in the context of best practices of protocol development and registration. More detailed research guides included potential sources for locating published systematic reviews, e.g., Epistemonikos, a database of health evidence.

Only 9 research guides (10.3%) did not provide any information related to conducting searches. Guides typically included suggested databases (e.g., Embase, PubMed/Medline (OVID), CINAHL Complete, Cochrane Library, Scopus, and Web of Science), sources of grey literature (e.g., OpenGrey.eu, medRxiv, NIH RePORTER, and Global Index Medicus), and suggested search tools (e.g., MeSH on Demand, Systematic Review Accelerator: Polyglot Search, and Yale MeSH Analyzer). More detailed guides contained additional databases that might be helpful for searching (e.g., ERIC, PsycINFO, OTSeeker, and speechBITE).

Reference management was highlighted in 74 research guides (85.1%). The most referenced citation management tools were Zotero, EndNote, RefWorks, and Excel. Systematic review software can also be used. The most referenced systematic review software mentioned included Covidence and DistillerSR.

In terms of screening, 74 research guides (85.1%) mentioned the use of systematic review software. Commonly highlighted software includes those with institutional subscriptions or fees (Covidence, DistillerSR, Cochrane RevMan, and EPPI-Reviewer IV) as well as open access software (Rayyan, abstrackr, and colandr). The SR Toolbox (Marshall et al., 2022) was also highlighted.

Critical appraisal was covered in 60 research guides (69.0%). The most referenced sources included the following: CASP checklists, Centre for Evidence-Based Management (CEBM) Critical Appraisal Tools, Cochrane Risk of Bias (ROB) 2.0 Tool, Jadad Scale, LEGEND (Let Evidence Guide Every New Decision) Evidence Evaluation Tools, AMSTAR (A MeaSurement Tool to Assess systematic Reviews) checklists, AHRQ SRDR+, Grading of Recommendations Assessment, Development and Evaluation (GRADE), JBI Critical Appraisal Tools, Newcastle-Ottawa Scale (NOS), Scottish Intercollegiate Guidelines Network (SIGN), and PEDro Scale.

Fewer research guides provided information or education on data extraction. Of the 46 guides (52.9%) that provided information, the most frequently referred to information included the following: example forms in Excel or Word and software (Covidence, DistillerSR, JBI Sumari).

Of the 87 research guides, 63 research guides (72.4%) made mention of services offered in support of evidence synthesis projects, and 24 did not (27.6%). Those offering support services fell into three categories: offering consultation and training only (13; 16%), offering a two-tier option of consultation and training as well as collaboration and co-authorship option (32; 36.8%), and a three-tier option with

consultation and training, collaboration with acknowledgment, and collaboration with co-authorship (18; 20.7%).

Discussion

Tools and Resources Shared

With this research, I aimed to identify tools and resources shared by librarians on systematic review research guides. The most referenced systematic review software tools were Covidence, DistillerSR, Cochrane RevMan, EPPI-Reviewer IV, Rayyan, abstrackr, and colandr. Several of these tools are either specific to publications (e.g., Cochrane) or require a subscription (e.g., Covidence and DistillerSR). For those institutions with subscriptions, it was more common to find a link to a single source, e.g., DistillerSR. For institutions without paid subscriptions, librarians creating these research guides either only provided links to the free open access software or included the subscription software with a note that it charged a fee. This directly tied into the citation management software suggested in the research guides. Subscription software can often handle citation management as well as data extraction, but the open software cannot. Therefore, when free screening software was suggested, it was likely also to find links to Zotero, EndNote, and RefWorks, including notices about potential fees with these tools.

Depending on the availability of resources (e.g., personnel, time), librarians may choose to refer to other research guides instead of creating their own informational or educational resources for a research guide. For example, a librarian may prefer to link directly to the commonly referenced video on YouTube prepared by the Cochrane Consumers and Communication Group, La Trobe University, supported by Cochrane Australia (Cochrane, 2016). Each librarian must decide if they should be referring to other institutions or if they should create their own institution-specific information. The latter would require additional support in terms of personnel. An understaffed librarian may not have the time.

The data collected calculated the most referred to systematic review research guide. It is interesting to note that Cornell University, which owns the most referenced research guide, was not in the top ten results of the incognito Google search. The present results lead to an unanswered question: how do librarians determine which research guides to reference? It is unknown whether they are using personal connections or a simple Google search to find potential source research guides. In future investigations, it might be possible to determine how librarians select or evaluate the research guides to which they refer.

Coverage of Stages of Systematic Reviews

Creating a research guide also requires that the authors determine how many informational or education resources to include. Although Stone et al. (2018) demonstrated enhanced student learning when resources were organized around the how and why of the research process, Lee et al. (2021) has shown that systematic review research guides currently act as information repositories sharing informational tools rather than educational resources. Knowing their audience leads guide creators to decisions that drive whether the systematic review research guide is a guide sharing few links with limited information or an in-depth resource geared toward faculty. Regarding protocol registration, the most minimal research guides provided links to OSF (https://osf.io/) and the PRISMA (http://www.prisma-statement.org/) websites. The most in-depth research guides provided information related to the planning process for publication. If resources related to publishing were shared, they were either near the research guide's beginning or the end. The benefit of selecting a journal for publication early in the

process is to ensure that standards are adhered to. For example, protocol registration or a specific standard such as Cochrane might be a requirement for publication.

Librarians included many links to recommended databases in the health sciences. It can be assumed that librarians feel most confident discussing library resources and how to use them. The question of depth of coverage relates to whether educational resources regarding these databases were shared or whether strategies for creating a sensitive, nonbiased, and reproducible search strategy were shared. Even in the conducting searches stage, which had the highest maximal coverage in the research guides studied, there were topics that librarians had omitted. For example, only several research guides included commonly used hedges as well as resources such as MeSH on Demand and the Yale MeSH Analyzer. Only two research guides referred to antiquated and potentially offensive language. The University of Michigan developed and included a note for authors on antiquated and potentially offensive language (Townsend et al., 2022). It is impossible to know why librarians omitted the information. Full-text article retrieval was barely acknowledged, and this may be because librarians are considering the information needs of the users when developing a guide. A researcher working on a systematic review may already be aware of the steps required to complete an interlibrary loan request.

It is unsurprising that the stages of a systematic review least covered in the studied research guides included critical appraisal and data extraction. These are two phases that typically require clinical or topical expertise and which may be least representative of librarians' skills. It is equally unsurprising that the stages with the greatest coverage across all surveyed research guides were the introductory, planning, guidelines and reporting standards, conducting searches, and reference management stages.

Support Services Offered

In terms of services offered, the general trend was three levels of service available. The first tier was consultation and training. When other tiers of service were offered, this first tier was a limited tier generally meant for graduate students. The librarian offered consultation and training but would not take an active role. The mid-level tier of service was a more active role which required acknowledgement in a published paper. The highest level of service was the partnership role, which required coauthorship in a published paper. The final data of services offered revealed that 16% of surveyed institutions only offered the consultation and training tier of service, 36.8% of institutions surveyed offered a two-tier system which included the consultation and training tier as well as the coauthorship tier, and 20.7% of institutions surveyed offered all three tiers of services. Rethlefsen et al. (2015) demonstrated the value of a librarian as coauthor in context of strengthening search strategies and search documentation. As formalized systematic review services are a documented role of librarians (Spencer and Eldredge, 2018), it is unsurprising to find 72.4% of research guides reviewed offered some level of support service. Many institutions offering the coauthorship tier of service also demonstrated their qualifications in support of offering these services. But without training, the initial question is whether a librarian is qualified to offer this service. Due to a bottleneck in service, several institutions stated that services offered were temporarily or permanently suspended, due to the overwhelming number of projects in line, staff cuts, and impacts from the pandemic. In such cases, it was most common to find those institutions offering only the consultation and training level of service. Finally, 3 institutions (3.5%) offered fee-based services for the coauthorship tier of service.

Potential Decisions Requiring Consideration

When creating or updating a systematic review research guide, librarians must determine the balance of how much information and how many tools to include. The decision must be driven by the needs of the patrons. An academic institution with a special focus designation may have different research needs than an institution designated with very high research activity (R1). Librarians must ask themselves what the aim of the research guide is. Several research guides provided no text description and many links to text without context. Other research guides displayed a learning-centered pathfinder design which told a "story" and explained in detail what a systematic review is and the guidelines necessary to successfully complete one. Charrois (2015) identified organizing potential studies during the search stage as a difficulty. An informational link to citation management software can lead to a solution for a researcher, while an educational resource to this same tool can be the solution. The organization of information is as important as the information provided. Librarians must also determine how they will maintain the research guide. Regardless of educational tools created or referral links to external resources provided, librarians must consider how they will maintain the accuracy and currency of the content shared.

Once the librarian has identified their audience, there are necessary decisions for a librarian to make before creating the research guide. Of the research guides surveyed, only 66% mentioned the required timeline and team necessary to complete a systematic review. These results are significant in recognizing the role of the academic librarian in the systematic review process. Additional research is needed to better understand the role librarians play in supporting systematic reviews (e.g., informing researchers that their projects are unlikely to be successful in the time allotted).

Limitations

This project was limited in scope to only research guides from U.S. institutions as well as research guides in the English language. This researcher acknowledges that there is great work coming out of other regions of the world, but it is beyond the scope of this paper to review all systematic review library research guides from elsewhere in the world. The search was also limited to an incognito search in Google for research guides covering systematic reviews. Research guides, regardless of platform or provider, were included. While these results did capture LibGuides on the SpringShare platform, SpringShare's community site was not searched for existing LibGuides.

While this is a survey of systematic review guides, this is not a systematic review of research guides. At best, this is a systematized review. The research team did not include two independent screeners and data extractors of the research guides screened and data collected, which could potentially introduce bias. The accessibility, usability, and the quality of included educational and informational resources were not appraised. A future step would be to determine an ideal gold standard of systematic review library research guides.

Conclusion

In this content analysis review, the author surveyed systematic review library research guides to determine considerations and decisions that academic librarians face when creating and updating these research guides and systematic review support services. Frequently used tools, software, guidelines, and standards frequently referenced in the research guides were highlighted. Although this study focused on systematic review research guides in the United States, the author attempted to minimize bias using an

incognito search in Google and hand searching to discover as many systematic review research guides as possible that met the inclusion criteria.

In conclusion, a systematic review library research guide is not the type of research guide that you can create and forget about. Tools, resources, services, and even the theory may develop over time. For example, commonly used tools and resources to screen results or extract data will change as artificial intelligence and machine learning continue to develop. Potential recommendations for librarians developing or updating systematic review research guides or support services include continual training and work in the field as well as maintaining familiarity with all resources and tools linked in the research guide.

References

American Council on Education. (2024). *Carnegie classifications of institutions of higher education*. https://carnegieclassifications.acenet.edu/index.php

Bergstrom-Lynch, Y. (2019). LibGuides by design: Using instructional design principles and user-centered studies to develop best practices. *Public Services Quarterly, 15*(3), 205–223. https://doi.org/10.1080/15228959.2019.1632245

Beverley, C. A., Booth, A., & Bath, P. A. (2003). The role of the information specialist in the systematic review process: A health information case study. *Health Information and Libraries Journal, 20*(2), 65–74. https://doi.org/10.1046/j.1471-1842.2003.00411.x

Bullers, K., Howard, A. M., Hanson, A., Kearns, W. D., Orriola, J. J., Polo, R. L., & Sakmar, K. A. (2018). It takes longer than you think: Librarian time spent on systematic review tasks. *Journal of the Medical Library Association, 106*(2), 198–207. https://doi.org/10.5195/jmla.2018.323

Chalmers, I., & Fox, D. M. (2016). Increasing the incidence and influence of systematic reviews on health policy and practice. *American Journal of Public Health, 106*(1), 11–13. https://doi.org/10.2105/AJPH.2015.302915

Charrois, T. L. (2015). Systematic reviews: What do you need to know to get started? *The Canadian Journal of Hospital Pharmacy, 68*(2), 144–148. https://doi.org/10.4212/cjhp.v68i2.1440

Cochrane. (2016, January 27). *What are systematic reviews*? [Video]. YouTube. https://www.youtube.com/watch?v=egJlW4vkb1Y

Cochrane. (2020, January 3). *Evidence synthesis - What is it and why do we need it?* https://www.cochrane.org/news/evidence-synthesis-what-it-and-why-do-we-need-it

Cornell University Library. (2023, May 19). *A guide to evidence synthesis: Types of evidence synthesis.* https://guides.library.cornell.edu/evidence-synthesis/types

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal,* 26(2), 91–108. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Harwood, T. G., & Garry, T. (2003). An overview of content analysis. *Marketing Review, 3*(4), 479–498. https://doi.org/10.1362/146934703771910080

Hoffmann, F., Allers, K., Rombey, T., Helbach, J., Hoffmann, A., Mathes, T., & Pieper, D. (2021). Nearly 80 systematic reviews were published each day: Observational study on trends in epidemiology and reporting over the years 2000-2019. *Journal of Clinical Epidemiology, 138*, 1–11. https://doi.org/10.1016/j.jclinepi.2021.05.022

Kim, I., & Kuljis, J. (2010). Applying content analysis to web-based content. *Journal of Computing and Information Technology, 18*(4), 369–375. https://doi.org/10.2498/cit.1001924

Koffel, J. B. (2015). Use of recommended search strategies in systematic reviews and the impact of librarian involvement: A cross-sectional survey of recent authors. *PLoS ONE, 10*(5), e0125931–e0125931. https://doi.org/10.1371/journal.pone.0125931

Lackey, M. J., Greenberg, H., & Rethlefsen, M. L. (2019). Building the systematic review core in an academic health sciences library. *Journal of the Medical Library Association, 107*(4), 588–594. https://doi.org/10.5195/jmla.2019.711

Laynor, G. (2022). Can systematic reviews be automated? *Journal of Electronic Resources in Medical Libraries, 19*(3), 101–106. https://doi.org/10.1080/15424065.2022.2113350

Lee, J., Hayden, K. A., Ganshorn, H., & Pethrick, H. (2021). A content analysis of systematic review online library guides. *Evidence Based Library and Information Practice*, *16*(1), 60–77. https://doi.org/10.18438/eblip29819

Li, L., Tian, J., Tian, H., Moher, D., Liang, F., Jiang, T., Yao, L., & Yang, K. (2014). Network meta-analyses could be improved by searching more sources and by involving a librarian. *Journal of Clinical Epidemiology, 67*(9), 1001–1007. https://doi.org/10.1016/j.jclinepi.2014.04.003

Marshall, C., Sutton, A., O'Keefe, H., Johnson, E. (Eds.). (2022). *The systematic review toolbox.* http://www.systematicreviewtools.com/

Meert, D., Torabi, N., & Costella, J. (2016). Impact of librarians on reporting of the literature searching component of pediatric systematic reviews. *Journal of the Medical Library Association, 104*(4), 267–277. https://doi.org/10.3163/1536-5050.104.4.004

Murphy, S. A., & Boden, C. (2015). Benchmarking participation of Canadian university health sciences librarians in systematic reviews. *Journal of the Medical Library Association, 103*(2), 73–78. https://doi.org/10.3163/1536-5050.103.2.003

Rethlefsen, M. L., Farrell, A. M., Osterhaus Trzasko, L. C., & Brigham, T. J. (2015). Librarian co-authors correlated with higher quality reported search strategies in general internal medicine systematic reviews. *Journal of Clinical Epidemiology, 68*(6), 617–626. https://doi.org/10.1016/j.jclinepi.2014.11.025

Spencer, A. J., & Eldredge, J. D. (2018). Roles for librarians in systematic reviews: A scoping review. *Journal of the Medical Library Association, 106*(1), 46–56. https://doi.org/10.5195/jmla.2018.82

Stone, S. M., Lowe, M. S., & Maxson, B. K. (2018). Does course guide design impact student learning? *College & Undergraduate Libraries, 25*(3), 280–296. https://doi.org/10.1080/10691316.2018.1482808

Toews, L. (2019). Benchmarking veterinary librarians' participation in systematic reviews and scoping reviews. *Journal of the Medical Library Association, 107*(4), 499–507. https://doi.org/10.5195/jmla.2019.710

Townsend, W., Anderson, P., Capellari, E., Haines, K., Hansen, S., James, L., MacEachern, M., Rana, G., & Saylor, K. (2022). Addressing antiquated, non-standard, exclusionary, and potentially offensive terms in evidence syntheses and systematic searches. https://doi.org/10.7302/6408

Tsafnat, G., Glasziou, P., Choong, M. K., Dunn, A., Galgani, F., & Coiera, E. (2014). Systematic review automation technologies. *Systematic Reviews*, *3*(1), 74. https://doi.org/10.1186/2046-4053-3-74

Wang, S., Scells, H., Koopman, B., & Zuccon, G. (2023). Can ChatGPT write a good Boolean query for systematic review literature search? https://doi.org/10.48550/arxiv.2302.03495

White, M. D., & Marsh, E. E. (2006). Content Analysis: A Flexible Methodology. *Library Trends*, *55*(1), 22–45. https://doi.org/10.1353/lib.2006.0053

Yoon, A., & Schultz, T. (2017). Research data management services in academic libraries in the US: A content analysis of libraries' websites. *College & Research Libraries, 78*(7), 920-933. https://doi.org/10.5860/crl.78.7.920