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# Digital Tools for Managing Different Steps of the Systematic Review Process

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# Digital Tools for Managing Different Steps of the Systematic Review Process

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## Abstract / Introduction

Performing systematic reviews (SR) and meta-analyses is an arduous and time-consuming process that involves not only comprehensive literature searching but also record de-duplication, title/abstract and full-text screening, data extraction, quality assessment, statistical analysis, data visualization, report writing, and the creation of a bibliography. In the past several years, several digital tools and software have become available to facilitate different steps of the systematic review process. However, due to the growing number of tools, it can be difficult for systematic reviewers to make fully informed decisions about which tool(s) to use. Here, we (1) compile a comprehensive list of currently available digital tools for managing steps of the systematic review process, (2) map the functionality of each tool onto various steps of the process with further consideration of their price, training materials, and technical support.

## Evaluation Method

A team of 5 librarians who provide systematic review support compiled a list of 15 SR software selected from the tools used by faculty or researchers in systematic review and by browsing through SR Tool Box and LibGuides. The criteria for tool selection included 1) to be able to help conduct functionality of the step(s) of SR and/or meta-analysis process; and 2) to be able to apply in health and medical settings. Each tool was assessed for its functionalities of screening, data analysis, manuscript preparation, cost, and support, and evaluated by two reviewers independently. Conflicts were resolved by consensus of two reviewers. The cost model for each tool was reviewed, and training materials and technical support were rated on three-scale (Poor, good, and excellent) defined by the team.

## Definition of Features

- Deduplication:** Tool itself identifies duplicates, or has article sorting and comparison ability
- Title/Abstract Screening:** Tool facilitates process of title/abstract visualization and ranking
- Full-Text Screening:** Tool can ingest and display full text of article for screening
- Data Extraction:** Tool is able to extract data from selected articles into a form or template
- Quality Assessment:** Tool has built in features (e.g., algorithms, rules) that actually assess article quality
- Meta Analysis:** Tool performs the meta analysis
- Data Visualization:** Tool creates and outputs actual visual plots from data tables
- Report Writing:** Tool provides an outline to structure the entire SR manuscript
- Bibliography:** Tool automatically generates formatted citations to literature in SR manuscript
- Cost:** Indicates whether free or paid versions available; if individual, team, and institutional subscriptions available
- Training Materials:** \*=poor, \*\*=good, \*\*\*\*=excellent quality training materials (written, online, video, etc.)
- Technical Support:** \*=online form only, \*\*=email support, \*\*\*\*=one-on-one support (phone or chat)

## Evaluation Chart

SR Tools	Screening			Data Analysis				Manuscript Preparation		Cost				Support	
	Deduplication	Title/Abstract Screening	Full-Text Screening	Data Extraction	Quality Assessment	Meta-Analysis	Data Visualization	Report Writing	Bibliography	Cost	Individual Subscription /Package	Team Subscription /Package	Institutional Subscription /Package	Training Materials	Technical Support
Abstrackr	No	Yes	No	No	No	No	No	No	No	Free	--	--	--	***	No
Covidence	Yes	Yes	Yes	Yes	Yes	No	No	No	No	\$	Yes	No	Yes	*****	***
DistillerSR	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	\$	Yes	Yes&	Yes	*****	*****
Colandr	Yes	Yes	Yes	Yes	No	No	No	No	No	Free	--	--	--	*****	***
EndNote	Yes	Yes	Yes	No	No	No	No	No	Yes	Free,\$	Yes	No	Yes	*****	*****
EPPI-Reviewer	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	\$	Yes	Yes	Yes	*****	*****+
Excel	Yes	Yes	No	Yes	No	No	Yes	No	No	\$	Yes	No	Yes	*****	***
JBI-SUMARI	No	Yes <sup>1</sup>	No	Yes	Yes	Yes	Yes	Yes	Yes	\$	Yes	--	--	*****	***
Mendeley	Yes	Yes	Yes	No	No	No	No	No	Yes	Free,\$	Yes	Yes	Yes	*****	***
OpenMeta[Analyst]	No	No	No	No	No	Yes	Yes	No	No	Free	--	--	--	*****	*
Rayyan	Yes	Yes	Yes	No	No	No	No	No	No	Free	--	--	--	***	***
RevMan5	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Free#	--	--	--	*****	No^
RefWorks	Yes	Yes	Yes	No	No	No	No	No	Yes	\$	--	--	Yes	*****	*****
SRDR (Systematic Review Data Repository)	No	No	No	Yes	No	No	No	No	No	Free	--	--	--	*****	*****
Zotero	Yes	Yes	Yes	No	No	No	No	No	Yes	Free	--	--	--	***	No

^ Technical support available only for Cochrane authors. # Free for non-commercial purposes. 1 Only do title screening  
& Team-based packages for corporate and government reviewers. + One to one tech support available for a fee.

## Summary

### Tools for Deduplication

Free: Colandr, Rayyan, Zotero  
Paid: Covidence, DistillerSR, EndNote, EPPI-Reviewer, Excel, Mendeley, RefWorks

### Tools for Data Analysis

Free: Colandr, OpenMeta[Analyst], RevMan5, SRDR  
Paid: Covidence, DistillerSR, EPPI-Reviewer, Excel, JBI-SUMARI

### Tools for Bibliography Creation

Free: EndNote, Mendeley, RevMan5, Zotero  
Paid: EndNote, Mendeley, RefWorks, JBI-SUMARI

### Tools for Screening

Free: Abstrackr, Colandr, Rayyan, Zotero  
Paid: Covidence, DistillerSR, EndNote, EPPI-Reviewer, Excel, Mendeley, RefWorks, JBI-SUMARI

### Tools for Report Writing

Free: RevMan5  
Paid: JBI-SUMARI

### Tools with Broadest Functionality

Free: RevMan5  
Paid: Covidence, DistillerSR, EPPI-Reviewer, JBI-SUMARI

## Additional Resources

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