

2019-05

# Frequency and Effects of Search Strategy Characteristics on Relevant Article Retrieval in Systematic Reviews

Townsend, Whitney A; Ginier, Emily C; MacEachern, Mark P;  
Saylor, Kate M

<https://dx.doi.org/10.7302/7860>

<https://hdl.handle.net/2027.42/177126>

<http://creativecommons.org/publicdomain/zero/1.0/>

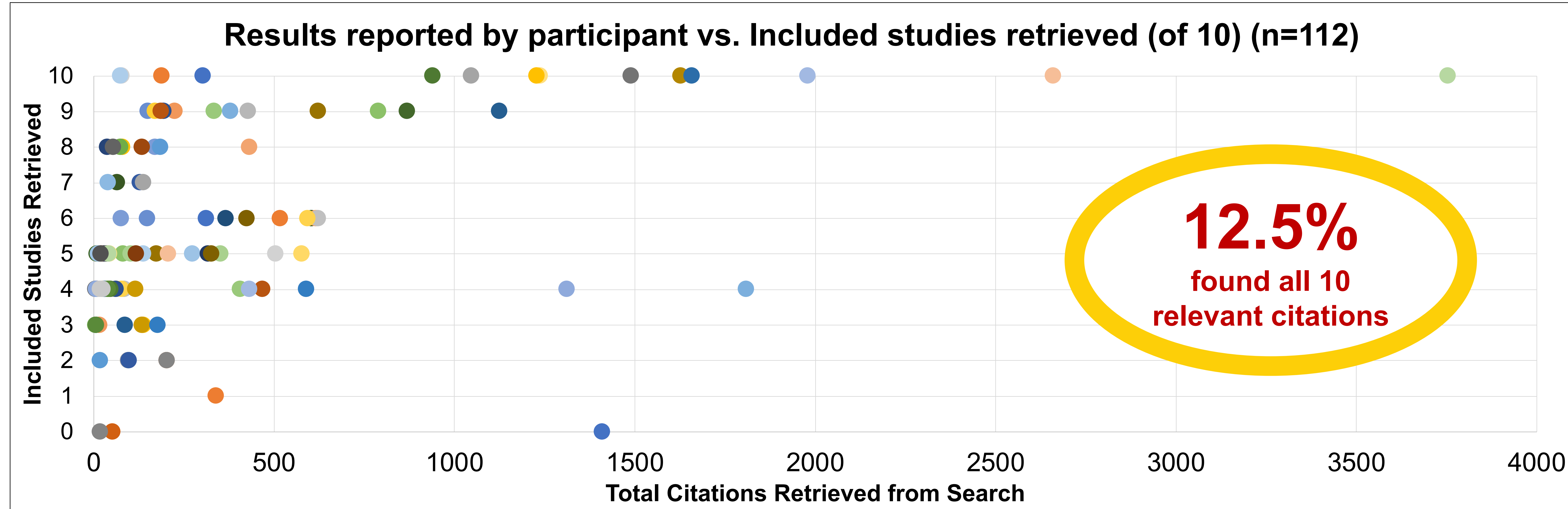


**Objectives**  
To identify common characteristics of highly effective search strategies for a clinical systematic review topic.

**Methods**  
Before attending an in-person systematic review workshop, participants asked to draft a reproducible search strategy based on a brief scenario and a research question from a published systematic review related to blood transfusion and radical prostatectomy. Participants are provided with three studies that were included in the published systematic review, but are not given the systematic review itself. The scenario proposes three commonly-requested limits: date range, inclusion of specific outcome, and human studies that participants can choose to apply or not. The submitted strategies are evaluated for reproducibility and effectiveness of retrieval of the 10 studies included in the published systematic review. Strategies were considered "highly successful" if they returned all 10 included studies. We conducted a thematic analysis on the 14 highly successful strategies to identify common characteristics between them that could guide future searchers. Two studies were disproportionately missed by the other 98 search strategies, and their PubMed records were analyzed to identify what made them particularly challenging to find.

We thank the MLA Research Training Institute for its training, support and encouragement to carry out this research. This project was made possible in part by the Institute of Museum and Library Services (RE-95-17-0025-17).

This study is IRB Exempt under HUM00128315.



## Characteristics of Highly Successful (10/10) Search Strategies

**LIMITS**  
applied in 10/10 and <10 searches

**THEMES**  
from 10/10 Searches

Highly Successful (n=14)	<10 studies (n=98)
--------------------------	--------------------

0%

64%

**Date Limits**

- Requested by Team
- "Custom" Date Limit
- "Last 10 Years" checkbox

**100%**

Truncated or used variants of key terms  
Ex: transfus\*

Ex: prostatectomy, prostatectomies  
Ex: prostate, prostatic, prostates

**100%**

Used field codes instead of relying solely on PubMed Automatic Term Mapping; 57% used [tw], 43% used [tiab] for keyword searching

**100%**

Structured their searches so that broad and variant terms for each concept were combined  
Ex: blood AND transfusion rather than "blood transfusion"

**Human Limits**

- \*Cochrane Sensitive (NOT/NOT) – counts as no limit
- Humans[Mesh]/checkbox
- Other (hybrid)

0%\*

43%\*

**Outcomes terms in search**

- Requested by team
- Wide variety of terms used

35%

69%

## Characteristics of Frequently Missed Citations

**Before all limits removed**

- Out of arbitrary researcher-requested date range
- Unindexed at the time of search (missed by Humans[MeSH] limit or MeSH-heavy strategies)
- Did not define specified outcomes in abstract

**After limits removed**

- Used only variants of prostatectomy or transfusion
- Used broader terminology than researcher request (transfusion instead of "blood transfusion")
- More than one/unusual index terms

	Prostatectomy Terms	Transfusion Terms
Paper 1 (1991) 1773291 Missed by 43% of searches (n=112)	Prostatic cancer Surgery Prostate/surgery[mesh] Prostatic Neoplasms/Surgery[mesh] <b>No Prostatectomy[mesh] or prostatectomy as text word</b>	Blood transfusion Transfusion Transfusions Transfused Non-transfused Transfusion Reaction[mesh] <b>No Blood Transfusion[mesh] term</b>
Paper 2 (1995) 7609106 Missed by 36% of searches (112)	Prostatectomy Radical retropubic prostatectomy Prostatectomy[mesh] Prostatic Neoplasms/surgery[mesh]	Blood loss Transfusions Autologous Allogeneic Transfused Transfusion Blood Loss, Surgical[mesh] <b>No "Blood Transfusion" as a phrase, no Blood Transfusion[mesh]</b>