A GUIDE TO CONDUCTING SYSTEMATIC REVIEW ON STROKE

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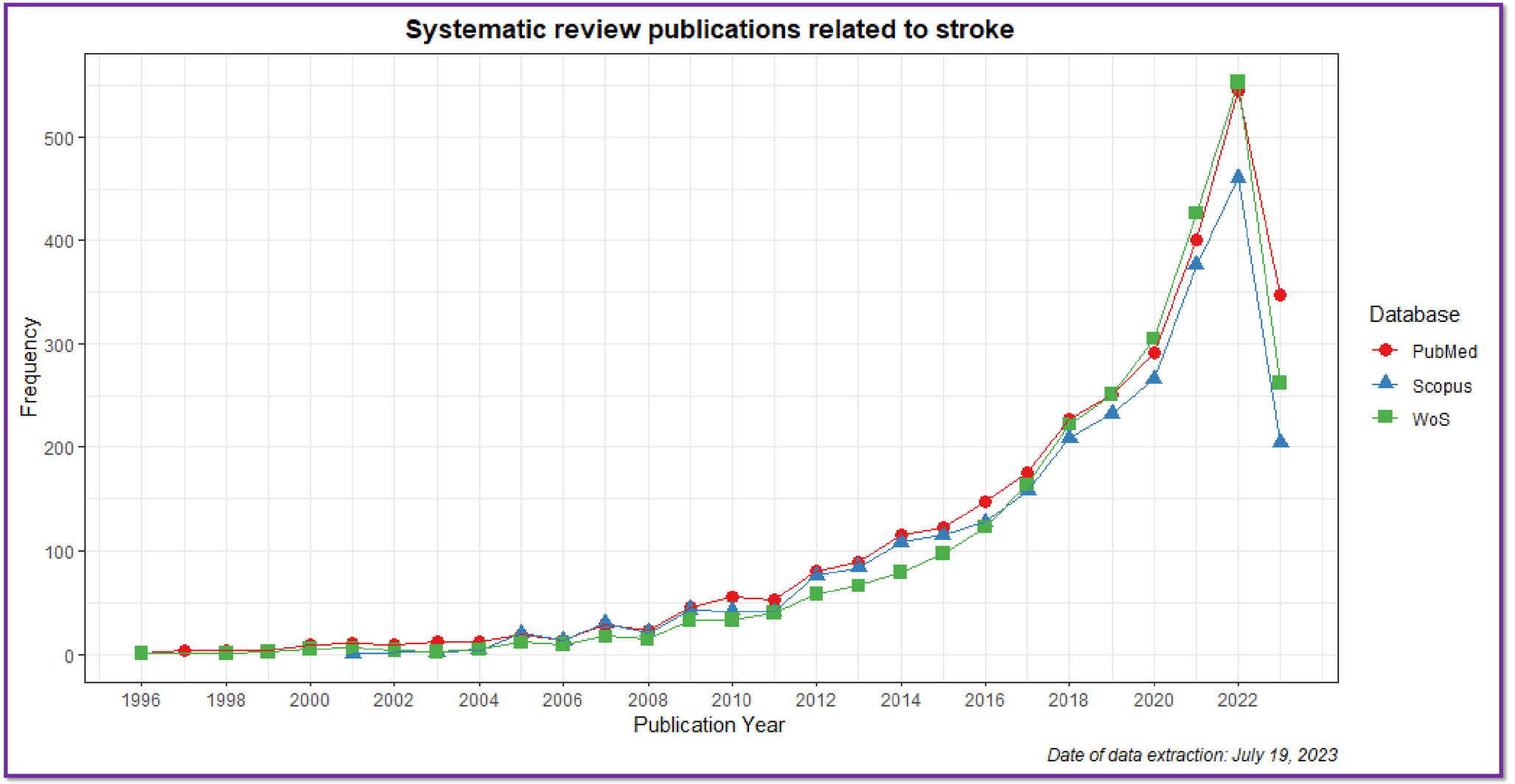
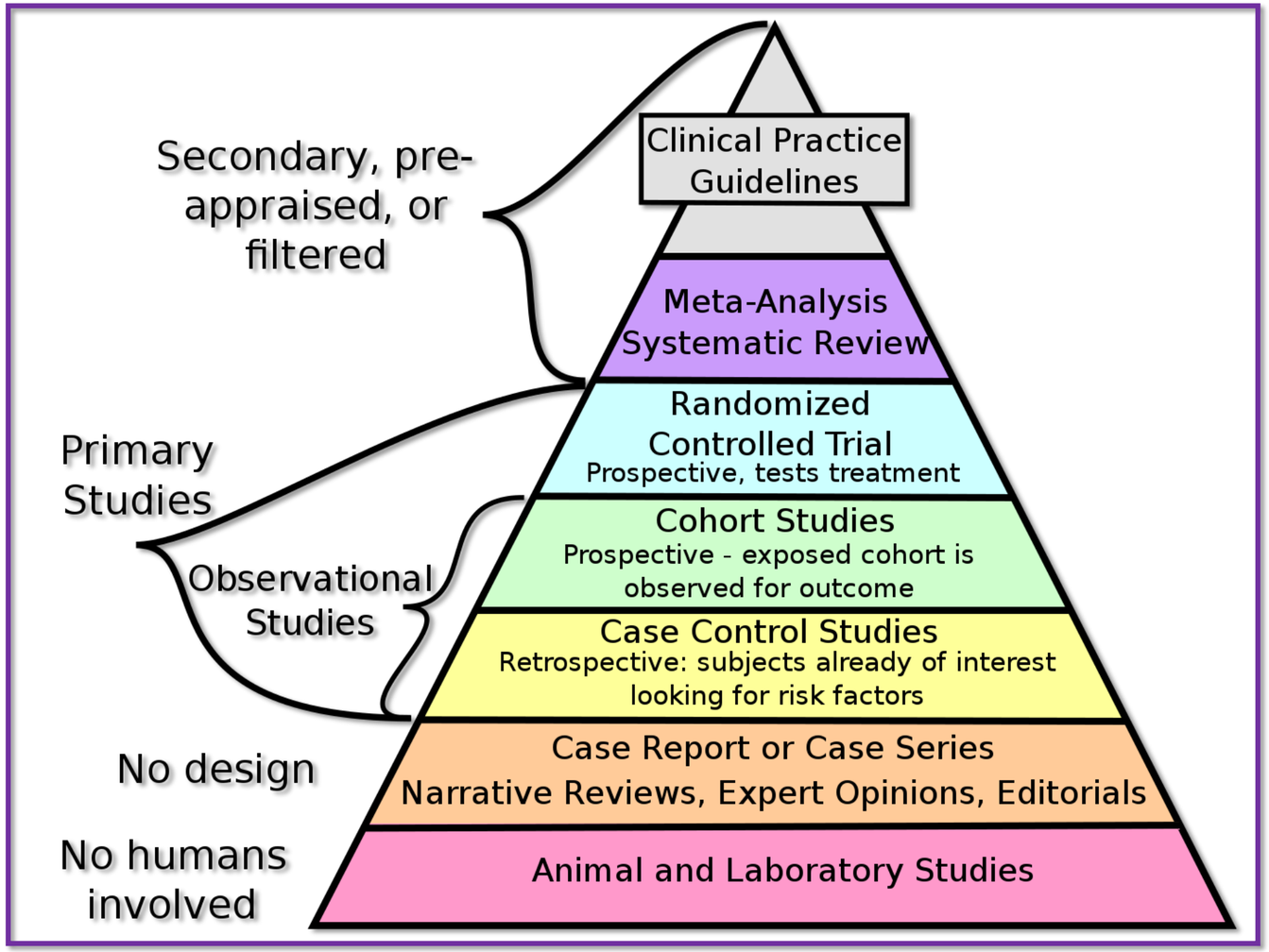
Systematic review

- A review of previous articles that uses **systematic** methods to collect and synthesise the finding to answer a well-defined question
  - **Systematic**: transparent and comprehensive, so that others able to replicate and update the review
- Systematic review papers related to stroke based on the databases (July 19, 2023):

Databases	Publications
Google Scholar	4,160
Scopus	2,635
Web of Science	2,791
PubMed	3,094


Systematic review publications related to stroke
Frequency
0
100
200
300
400
500
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Publication Year
Database
PubMed
Scopus
WoS
Date of data extraction: July 19, 2023

Why?



Health Sciences Library, 2023

Steps

1) Formula research question – be specific
2) Develop the review plan:
   - Define objectives, scope: PICO(S) - Patients, Intervention, Comparison, Outcome, Study design
   - Other data to be collected - make a form or a list
   - Select databases:
     - Free: Google Scholar, PubMed, Dimension, Cochrane, etc
     - Scopus, Web of science, Embase, etc
3) Define selection criteria
4) Formulate a search strategy
   - Develop search terms
   - Pre-test on databases

5) Perform paper searching and extraction from the databases
6) Screen the papers:
   - At least two independent reviewers
   - Removes duplicates
   - Apply predefined selection criteria
   - Start with the title, abstract and full-text (if needed)
7) Download full-text for included papers
8) Register the review protocol (systematic review plan) – PROSPERO
9) Data extraction:
   - At least two independent reviewers
   - Make a characteristic table while reviewing
   - Extract data based on the plan formulated in Step 2

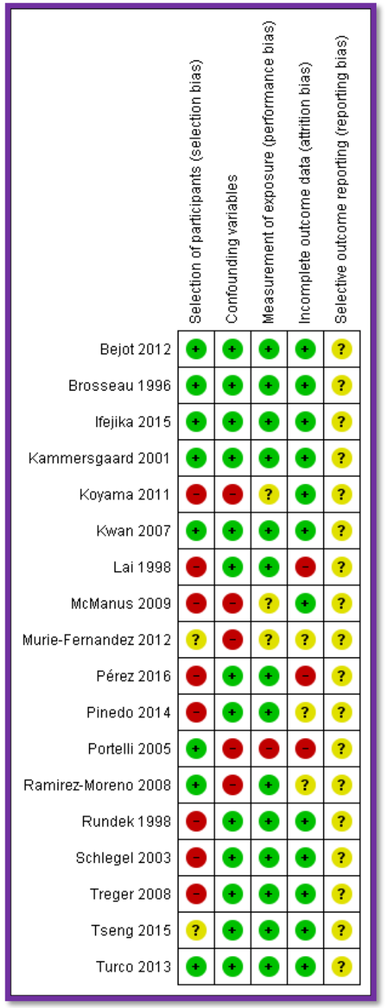
Table 1 Descriptive characteristics and findings of included studies in stroke subcategory

		Sample	Intervention	Comparison	Outcome	Test	Results	Conclusion	User feedback / follow-up info
[29]	Adomaviciene 2019 RCT	N=42 Subacute Mean age= 64.6	VR Kinect + conventional 2 weeks 5 times/ week	Conventional with robot-assisted trainer "Armeo Spring" 2 weeks 5 times/ week	UE mobility Function* Psycho-emotional	FMA, MAS BBT, HTT ROM, FIM HAD	No between group difference in FIM, but p<0.05 in self-care in VR. UE function significant improvement p<0.05 in both groups VR p<0.05 in HAD	Both groups improved in function, UE mobility and cognitive abilities.	Great user satisfaction, improved psycho-emotional state in VR/ No follow-up
[20]	Fishbein 2019 RCT	N=22 Chronic Mean age= 65.2	VR dual task walking 4weeks 2 times/ week	Conventional treadmill single task walking 4weeks 2 times/ week	Gait Balance Function	10MWT, TUG FRT, BBS ABC	VR p<0.01 in BBS, FRT, 10MWT, ABC	VR is effective in improvement of balance, gait and function. Advised combination with conventional training with multitasking	Follow-up 4 weeks – effect maintained
[32]	Kiper 2018 RCT	N = 136 Chronic, subacute Mean age= 63.9	VR + conventional 4 weeks 5 times/ week	Conventional 4 weeks 5 times/week	UE mobility Function	FMA FIM NIHSS ESAS	VR + conventional p<0.05 in all outcomes	VR combined with conventional has greater effect on UE function	No follow-up

Sevcenko &Lindgren, 2022

10) Analyse the data (quantitatively):
   - Descriptive – summary of characteristics table
   - Report the results (related to the research question and objectives)
   - Interpret the result and draw a conclusion
   - Make sure to answer the research question and achieve the objectives
11) Assess the quality of the study
   - At least two independent reviewers
   - Use critical appraisal tools:
     - ROBINS-I: non-randomised intervention studies
     - RoB 2: randomised trials/studies
     - CASP: RCT, cohort, case-control, etc
     - JBI: RCT, cohort, case-control, etc

– Quality assessment can be presented in text or in figure



Burton et al., 2018

Quality assessment

Filtered and selected for a full-text reading articles (n = 59) were assessed for methodological quality by the CASP tool for randomized controlled trials [19]. Articles included in the final list for the review were graded 9–11 (high quality), assuming that double blinding was not possible in such experimental studies. The grading was not affected if the RCT was at least single-blinded. Five studies [20–24] did not provide a sample size/ power calculations but this limitation was not determinant in the grading. All studies reported on correct randomization procedures, low drop-out rates and few losses to follow-up. Few studies had selective reporting of effects for some secondary outcomes. All studies had limited generalizability of results.

Sevcenko &Lindgren, 2022

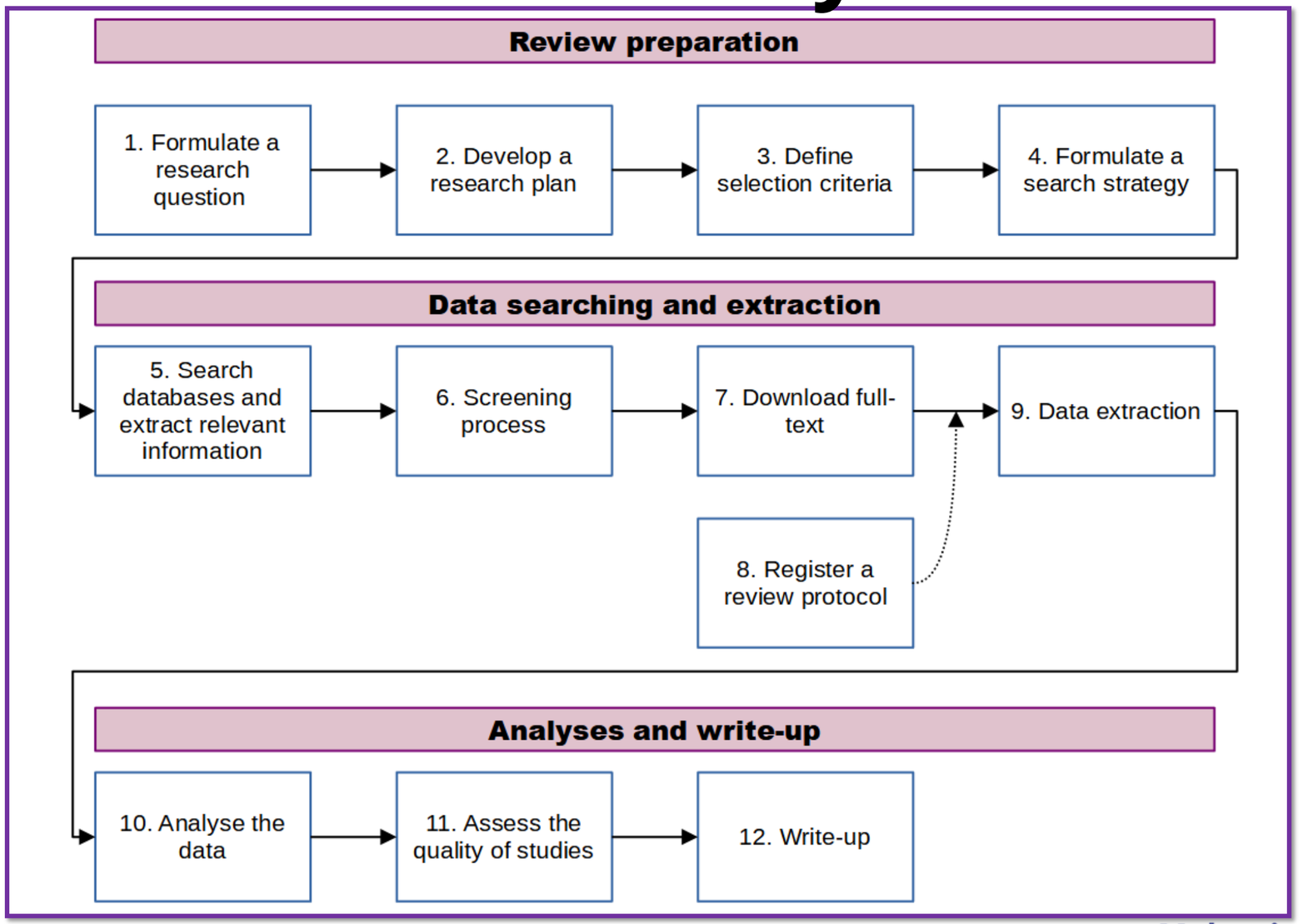
12) Start write-up:

- Use PRISMA guideline

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	

Summary


Review preparation
1. Formulate a research question
2. Develop a research plan
3. Define selection criteria
4. Formulate a search strategy
Data searching and extraction
5. Search databases and extract relevant information
6. Screening process
7. Download full-text
9. Data extraction
8. Register a review protocol
Analyses and write-up
10. Analyse the data
11. Assess the quality of studies
12. Write-up

References

- Burton JK, Ferguson EEC, Barugh AJ, et al. Predicting Discharge to Institutional Long-Term Care After Stroke: A Systematic Review and Metaanalysis. J Am Geriatr Soc. 2018;66(1):161-169. doi:10.1111/jgs.15101
- Page MJ, Moher D, Bossuyt PM, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. BMJ. 2021;372. doi:10.1136/bmj.n160
- Health Sciences Library. Systematic Review Toolbox. Published 2023. Accessed July 20, 2023. https://hslib.jabsom.hawaii.edu/systematicreview
- Sevcenko K, Lindgren I. The effects of virtual reality training in stroke and Parkinson's disease rehabilitation: a systematic review and a perspective on usability. Eur Rev Aging Phys Act. 2022;19(1):4. doi:10.1186/s11556-022-00283-3

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Thank you!

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