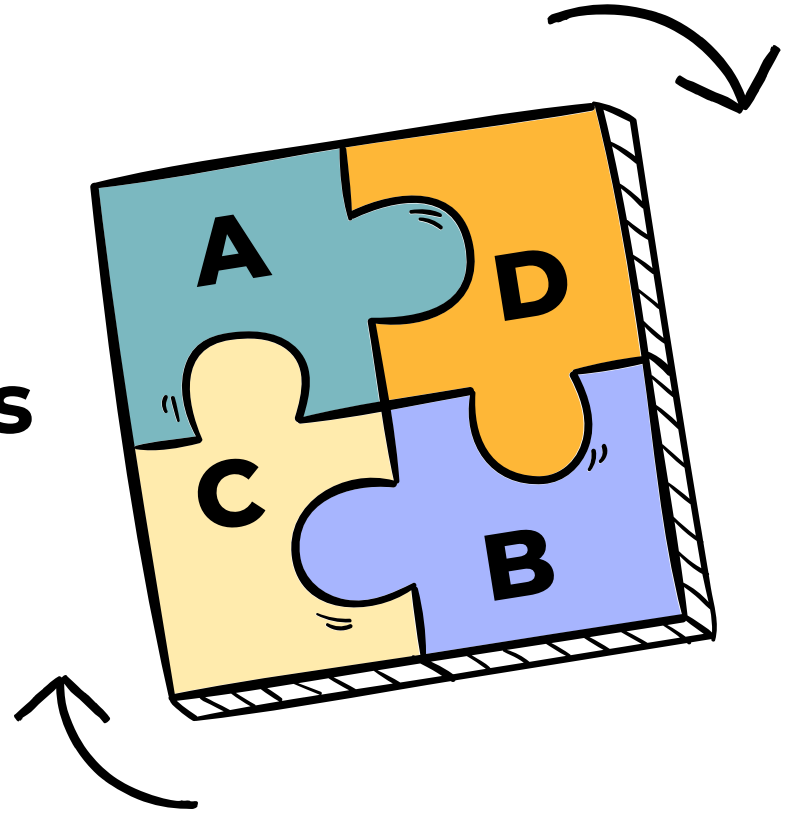


Review & Conquer: Navigating the World of Systematic Reviews and Meta-Analyses

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University of Calgary



Outline



Ready, Set, Review!

Foundational steps of planning and preparing for a systematic review



Data Dash

The process of gathering and organizing data in a systematic way



Meta Magic

Meta-analysis techniques, presentation of data, and interpretation of results



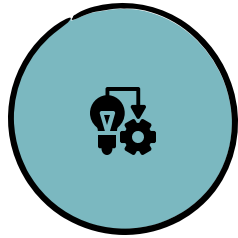
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READY, SET, REVIEW!

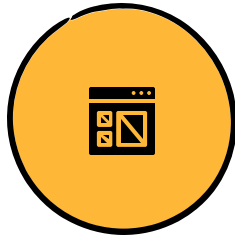
Foundational steps of planning and preparing for a systematic review

Is a systematic review even right for me?



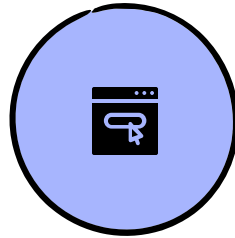
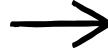
01

How much of the literature do you want to cover in your search?



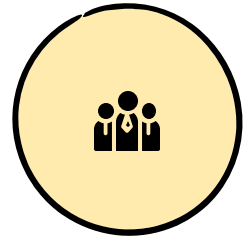
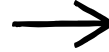
02

Is there a type of study you want to look for?



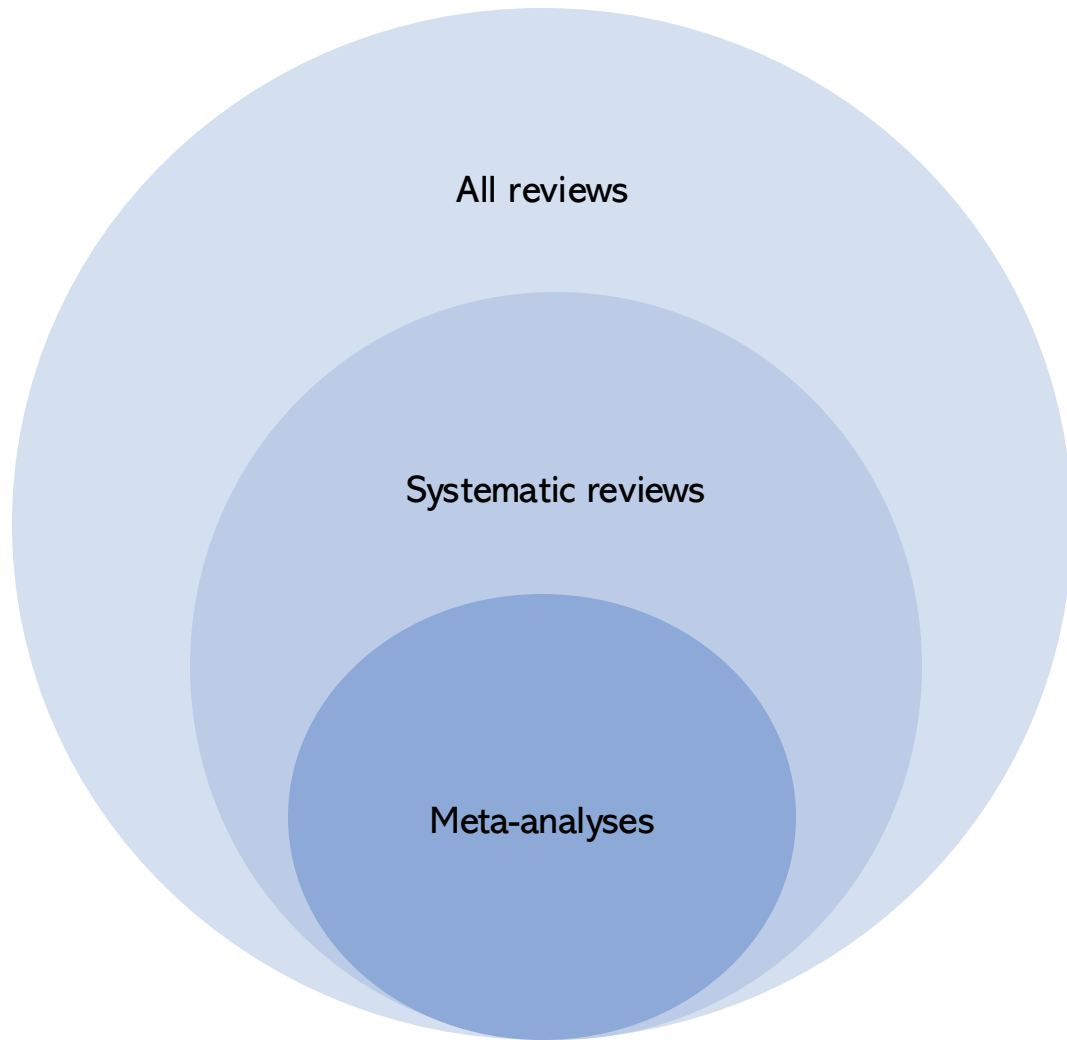
03

Do you want to follow very specific rules/guidelines?



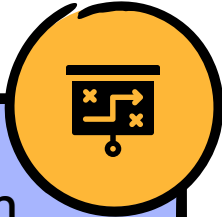
04

Does your review need to compare, evaluate or synthesize the evidence?



**What are
systematic
reviews and
meta-analyses?**

Step 0: Preliminary Investigation of the Literature



How much literature exists for the the topic of interest?



Is there already a relevant systematic review conducted?



Register your review title if possible

Step 1: Structuring your Research Question

01

Population, Patient, or Problem

What are the characteristics of the patient or population?
What is the condition you are interested in?



02

Intervention

How do you want to help your chosen patient population?



Comparison

What are you comparing the intervention with?

04

03

Outcomes

What is your goal?



Time

Over what period of time are you looking to assess the outcome?

05

Your turn! Try to use this framework to come up with a question of your own!

01

Population, Patient, or Problem

What are the characteristics of the patient or population?
What is the condition you are interested in?



02

Intervention

How do you want to help your chosen patient population?



Comparison

What are you comparing the intervention with?

04

03

Outcomes

What is your goal?



Time

Over what period of time are you looking to assess the outcome?

05

An Example

01

Population, Patient, or Problem

In adults with depression,



02

Intervention

is cognitive behavioral therapy



Comparison

more effective than medication

04

03

Outcomes

in reducing symptoms



Time

over 6 months?

05



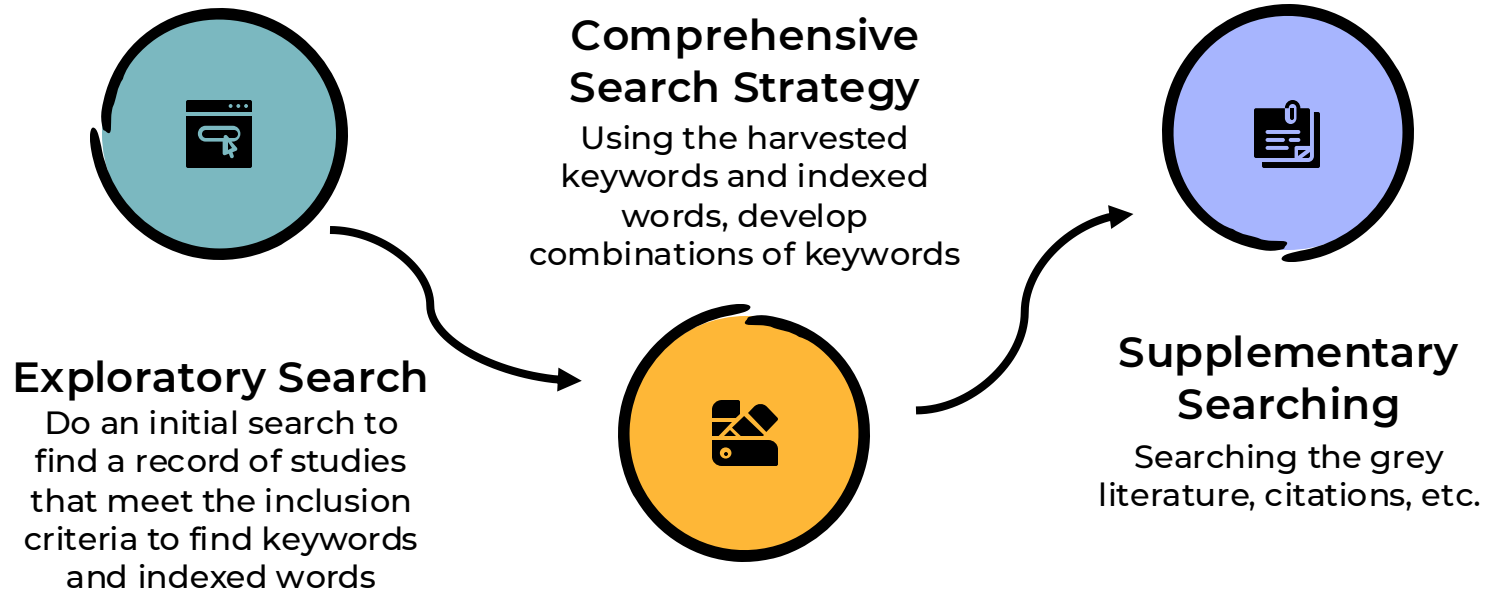
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DATA DASH

The process of gathering and organizing data in a systematic way

Step 2: Developing your Search Strategy



MEDLINE (Ovid) ALL

1946 to February 19, 2021

Date search conducted: February 20, 2021

Strategy:

1 Euthanasia/ (7973)

2 Euthanasia, Active/ (2200)

3 Euthanasia, Active, Voluntary/ (1773)

4 Euthanasia, Passive/ (5973)

5 ((accompanied or assist*) adj2 (death* or dying or suicide*)).tw,kf. (5279)

6 euthanasia*.tw,kf. (22,539)

7 "medical assistance in dying".tw,kf. (229)

8 planned death.tw,kf. (18)

9 (physician hastened adj2 (death* or dying or suicide*)).tw,kf. (16)

10 "right to die".tw,kf. (963)

11 or/1-10 [Set 1: Medical assistance in dying] (30,314)

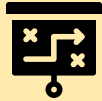
12 Donor Selection/ (3345)

13 exp Organ Transplantation/ (214,434)

Step 3: Screening

Title Screening

Does the title fit our research question (PICOT)?



Abstract Screening

Look at your inclusion criteria, check for PICOT again



Full-Text Screening

Thorough reviews of the full-text to confirm criteria was met



Identification

Number of records returned from the database search

Number of additional records identified from other sources

Number of records remaining after removing duplicates

Screening

Number of records screened by title and abstract

Number of records excluded, with reasons

Eligibility

Number of articles assessed by full text

Number of articles excluded, with reasons

Inclusion

Number of studies included in the systematic review

Number of studies included in the meta-analysis

Step 4: Data Extraction



Use a
Standardized
Tempalte



Double Data
Extraction



Define Variables
Clearly



Pilot Testing!

EXERCISE TIME!

Abstract:

Background: Type 2 diabetes is a prevalent chronic disease that requires effective management strategies. Aerobic exercise has been proposed as a non-pharmacological intervention to improve glycemic control in this population.

Objective: To evaluate the impact of daily aerobic exercise on hemoglobin A1c (HbA1c) levels in adults with Type 2 diabetes.

Methods: This randomized controlled trial enrolled 250 adults aged 45-65 diagnosed with Type 2 diabetes. Participants were randomly assigned to an intervention group, which engaged in 30 minutes of moderate aerobic exercise daily, or a control group receiving standard care with no additional exercise intervention. The primary outcome was HbA1c levels at 6 months, measured in a certified lab. Secondary outcomes included changes in body weight and blood pressure.

Results: At 6 months, the intervention group showed a significant reduction in HbA1c levels, with a mean difference of 1.2% (95% CI: 1.0 - 1.4) compared to the control group. Additionally, the intervention group demonstrated a significant reduction in body weight (mean difference of 2.5 kg, $p < 0.05$) and systolic blood pressure (mean difference of 5 mmHg, $p < 0.05$) compared to controls.

Conclusion: Daily aerobic exercise significantly improves blood sugar control and contributes to weight and blood pressure reduction in adults with Type 2 diabetes. However, further studies are recommended to explore the long-term effects and adherence rates beyond six months.



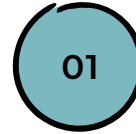
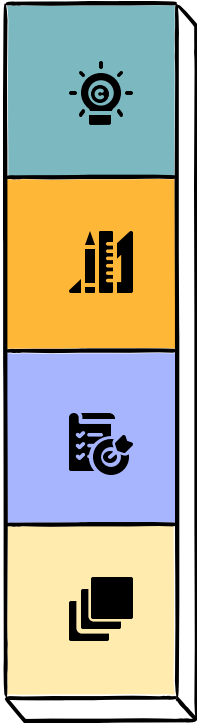
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META MAGIC

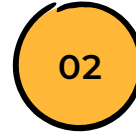
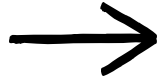
Meta-analysis techniques, presentation of data, and interpretation of results

Key Concepts in Meta-Analyses



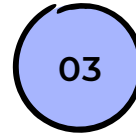
Effect Size

Reflects the strength or magnitude of an intervention



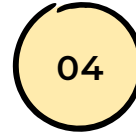
Confidence Interval

Range of values within which the true effect size lies, with a specific confidence



Heterogeneity

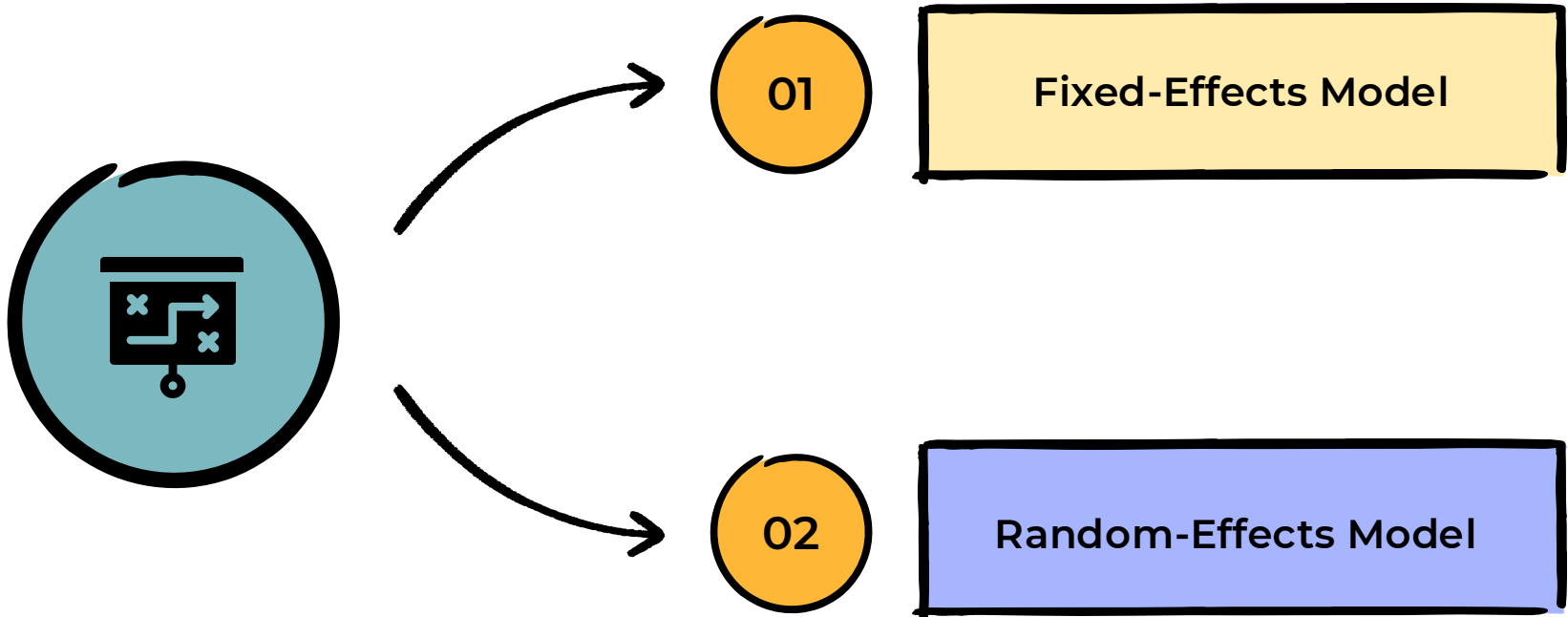
Degree of variability



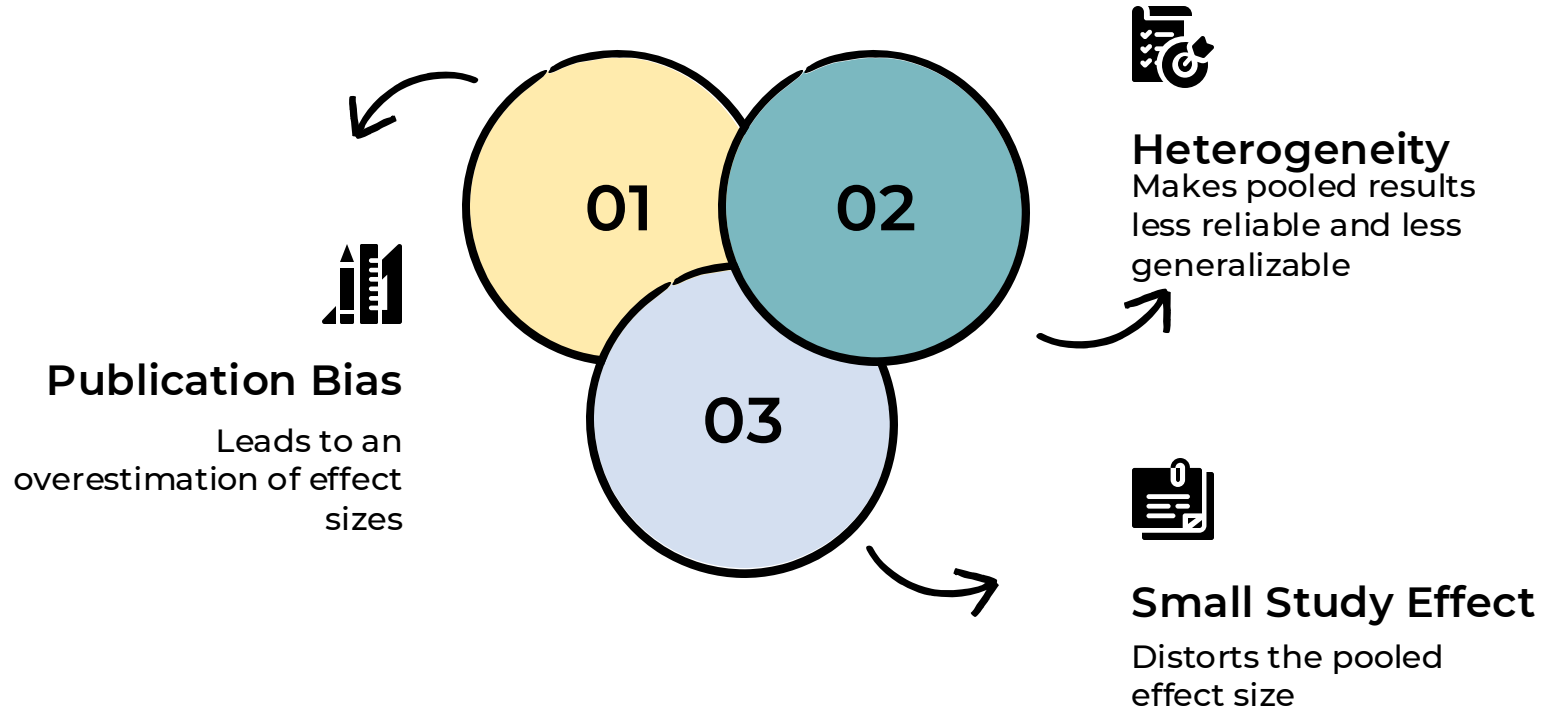
Models

Fixed-Effects vs. Random Effects

How to Choose the Right Model



Common Pitfalls and Challenges



Any Questions?



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