

SYSTEMATIC REVIEW AND META-ANALYSIS



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INTRODUCTION

A **systematic review** refers to the entire process of selecting, evaluating, and synthesizing all available evidence, while the term **meta-analysis** refers to the statistical approach to combining the data derived from a **systematic-review**.

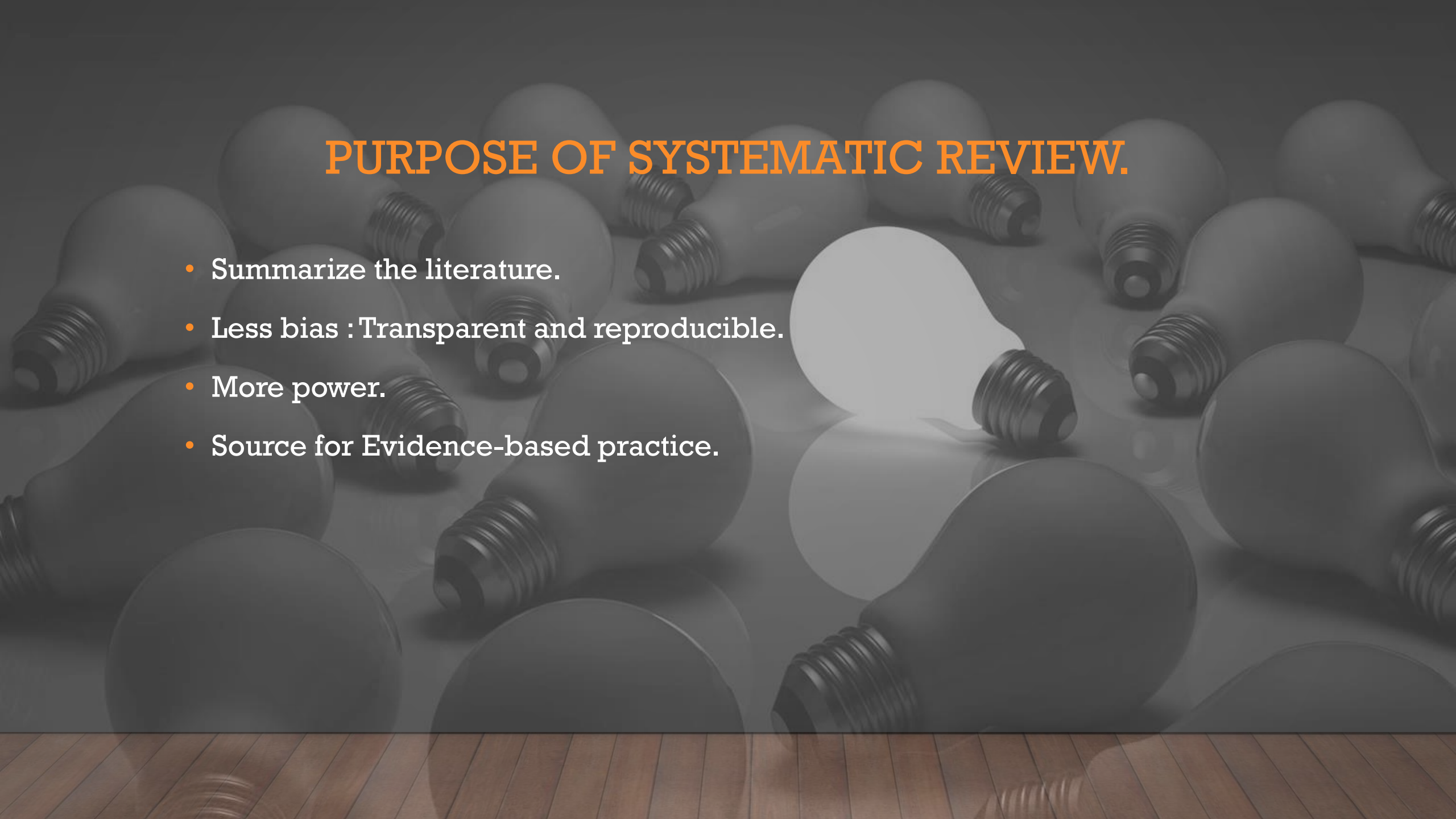
It is much more than a literature review.

Mainly carried out by medical researchers to synthesize all the available evidence on a question.

IS LITERATURE REVIEW AND SYSTEMATIC REVIEW SAME.....?



- It is common to confuse between systematic review and literature review as both are used to provide summary of the existent literature or research on a specific topic.
- Even though it has a few similarities like summarising the available literature they vary significantly.
- In literature review a broad term referring to reviews with a wide scope and non-standardized methodology is used whereas in systematic review has a narrow scope and follows a standardized protocol.



PURPOSE OF SYSTEMATIC REVIEW.

- Summarize the literature.
- Less bias : Transparent and reproducible.
- More power.
- Source for Evidence-based practice.

STEPS INVOLVED IN SYSTEMATIC REVIEW

- STEP 1 → Framing the question.
- STEP 2 → Search the Literature.
- STEP 3 → Select the studies.
- STEP 4 → Appraise the studies.
- STEP 5 → Extract the Data.
- STEP 6 → Summarize the Data.
- STEP 7 → Reporting.

BIAS IN SYSTEMATIC REVIEW.

- The main role of a systematic review is to minimize the bias at all stages of the review process.
- There are different types of bias:
 - ✓ Selection bias.
 - ✓ Performance bias.
 - ✓ Attrition bias.
 - ✓ Detection bias.
 - ✓ Reporting bias.

QUALITATIVE SYNTHESIS.

- ❑ Refers to an assessment of the body of evidence that goes beyond factual description.
- ❑ The qualitative synthesis seeks to describe:-
 - The nature of evidence in the literature,
 - Interpret the possible effect of the differences among the individual studies
 - Evaluate the strengths and weaknesses of the evidence base.

META-ANALYSIS

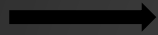
- It is an optional component of the entire systematic review.
- Qualitative analysis refers to the structured description whereas quantitative analysis involves statistical analysis and is called the meta-analysis.

REASONS TO DO META-ANALYSIS :-

- To settle any conflict between studies.
- To quantify uncertainty.
- Meta-analysis helps in quantifying the variation across studies.
- To answer those questions which could not be answered by the individual studies.

STEPS INVOLVED IN META-ANALYSIS

STEP 1



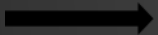
Formulate the
problem.

STEP 2



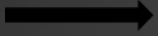
Literature search

STEP 3



Study selection

STEP 4



Decide which
variables are allowed.

STEP 5



Select the model

MODELS OF META-ANALYSIS

There are two models of meta-analysis :-



Fixed effect model –
It is assumed that
there's only one true
effect



Random effect
model - It is
assumed that there's
a distribution of true
effects.

CONCLUSION

- Like all kinds of research, systematic reviews and meta-analyses have both potential strengths and weaknesses.
- Healthcare-decision makers in search of the simplest evidence to inform clinical decisions have come to rely on systematic reviews.
- Thus, it is used to set agendas and funding for primary research by highlighting gaps in evidence.

THANK YOU

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