آشنایی با اصول مقاله مرور سیستماتیک

دکتر رضا تبریزی
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Types of primary studies

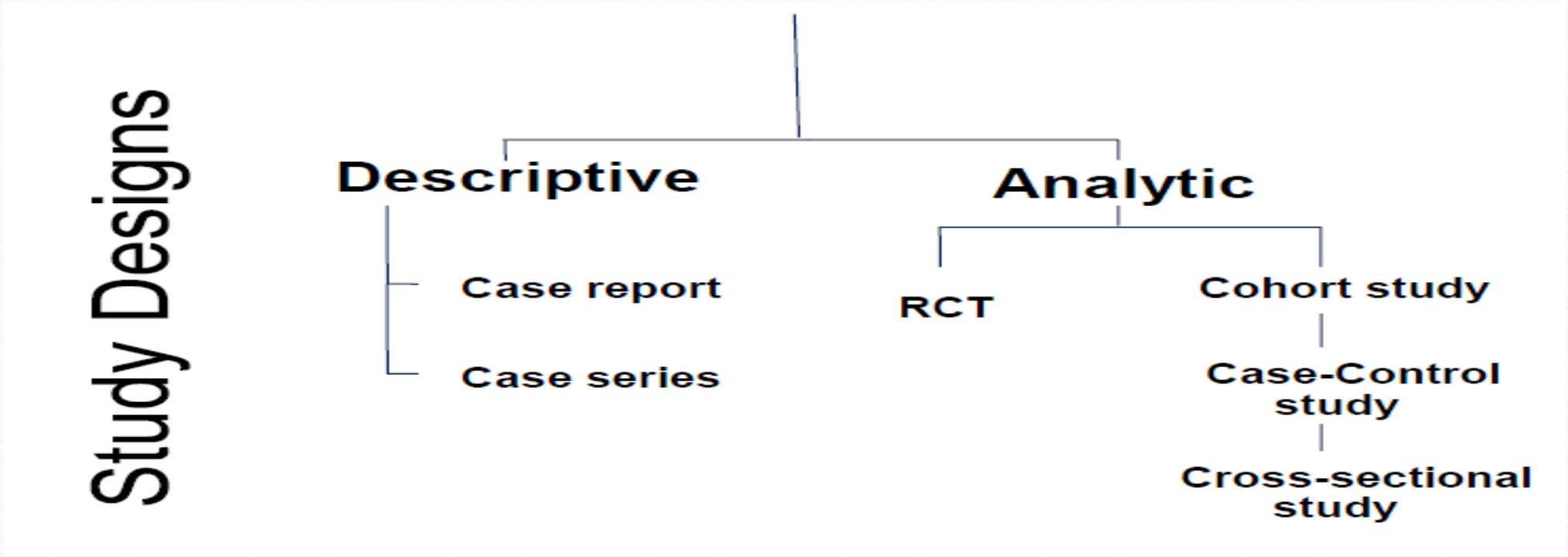
- Descriptive studies

-describe occurrence of outcome

- Analytic studies

–describe **association between exposure and outcome**

Types of primary studies



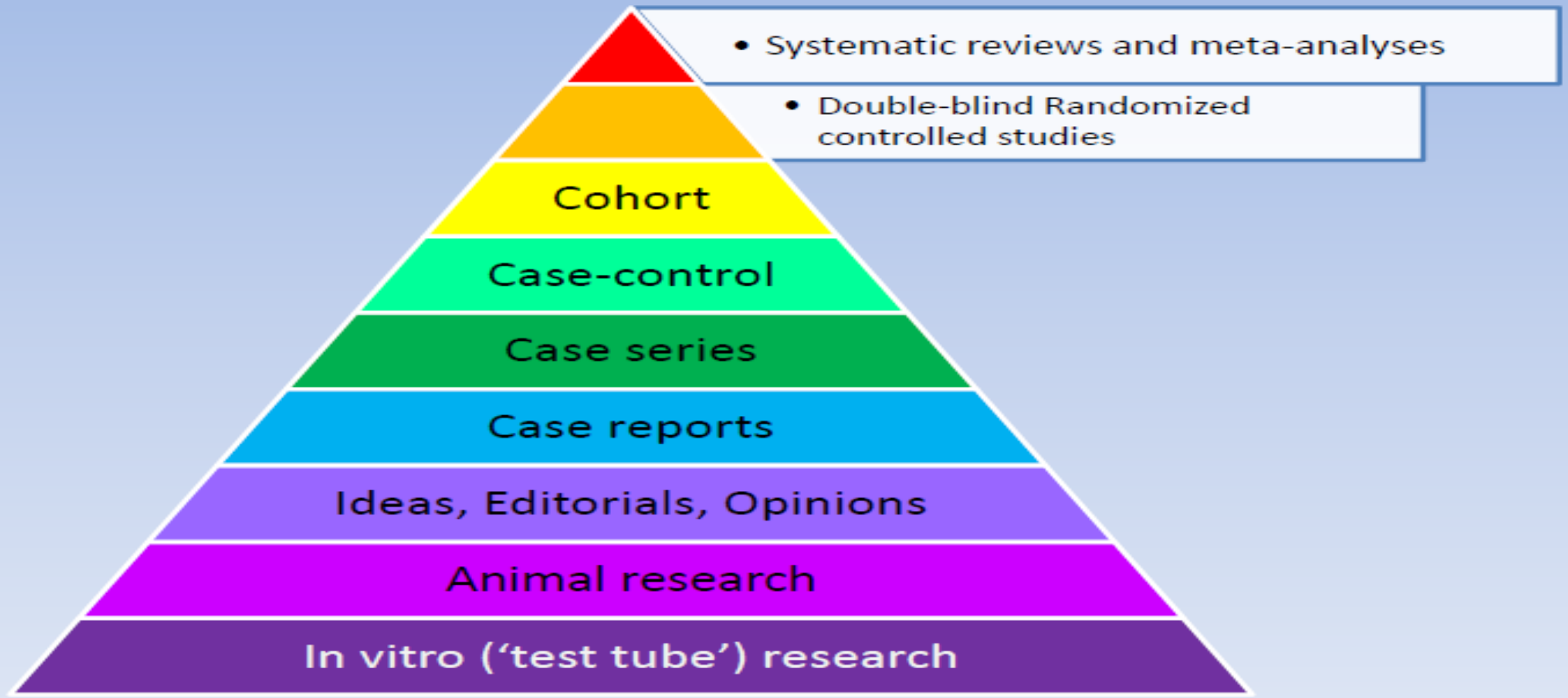
Common problems when using primary studies

- ❑ Small size
- ❑ Single center
- ❑ Multiple bias

Vs.

- ✓ Valid (particularly minimizing bias)
- ✓ Comprehensive (include all relevant data)

INTRODUCTION



Descriptions of Types of Reviews

- **Mapping review**
- **Mixed studies review**
- **Qualitative systematic review**
- **Rapid review**
- **Scoping review**
- **Literature review**
- **Umbrella review**
- **Systematic review**
- **Systematic review and meta-analysis**

Descriptions of Types of Reviews

- **Mapping review/systematic map**: Map out and categorize existing literature from which to commission further reviews and/or primary research by identifying gaps in research literature
- **"Mixed studies review/mixed methods review:** it refers to a combination of review approaches for example combining quantitative with qualitative research
- **Qualitative systematic review/qualitative evidence synthesis:** Method for integrating or comparing the findings from qualitative studies

Rapid review

- **Rapid review:** A form of knowledge synthesis that accelerates the process of conducting a traditional systematic review through streamlining or omitting specific methods to produce evidence for stakeholders in a resource-efficient manner

Difference between rapid review and systematic review

	Rapid Review	Systematic Review
Timeframe	1 to 6 months	Minimum of 1 year
Literature Search	Database searches – hand searching and grey literature can be excluded	Comprehensive searching is required – no limitations
Searching	Limits can be applied (language or years etc.)	No limits are applied to searching
Synthesis	Descriptive summary of the findings	Descriptive summary of finding and includes a meta-analysis
Reviewers Required	One person	At least two people

Scoping review

- **Scoping review:** Preliminary assessment of potential size and scope of available research literature. Aims to identify nature and extent of research evidence (usually including ongoing research).
- **In the other words**: The purpose of a **scoping review** is to provide an overview of the available research evidence without producing a summary answer to a discrete research question.

Difference between scoping review and systematic review

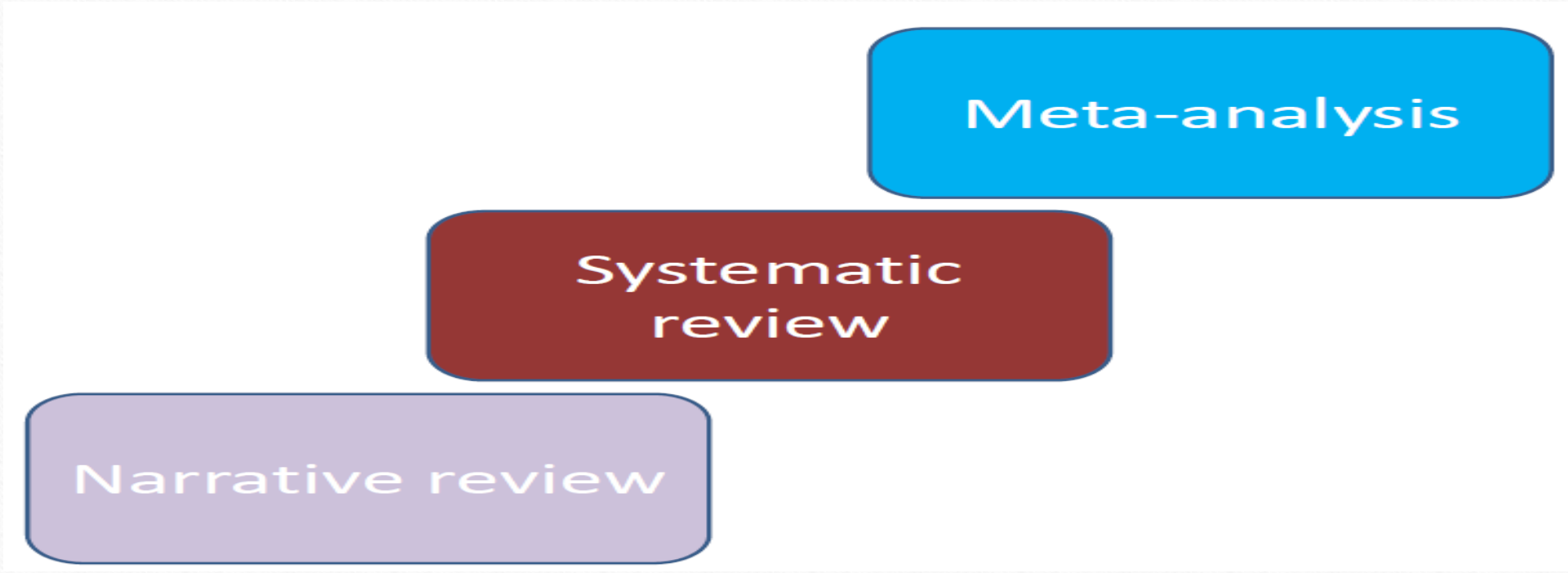
Systematic Review	Scoping Review
Focused research question with narrow parameters	Research question(s) often broad
Inclusion/exclusion usually defined at outset	Inclusion/exclusion can be developed *post hoc*
Quality filters often applied	Quality not an initial priority
Detailed data extraction	May or may not involve data extraction
Quantitative synthesis often performed	Synthesis more qualitative, and typically not quantitative

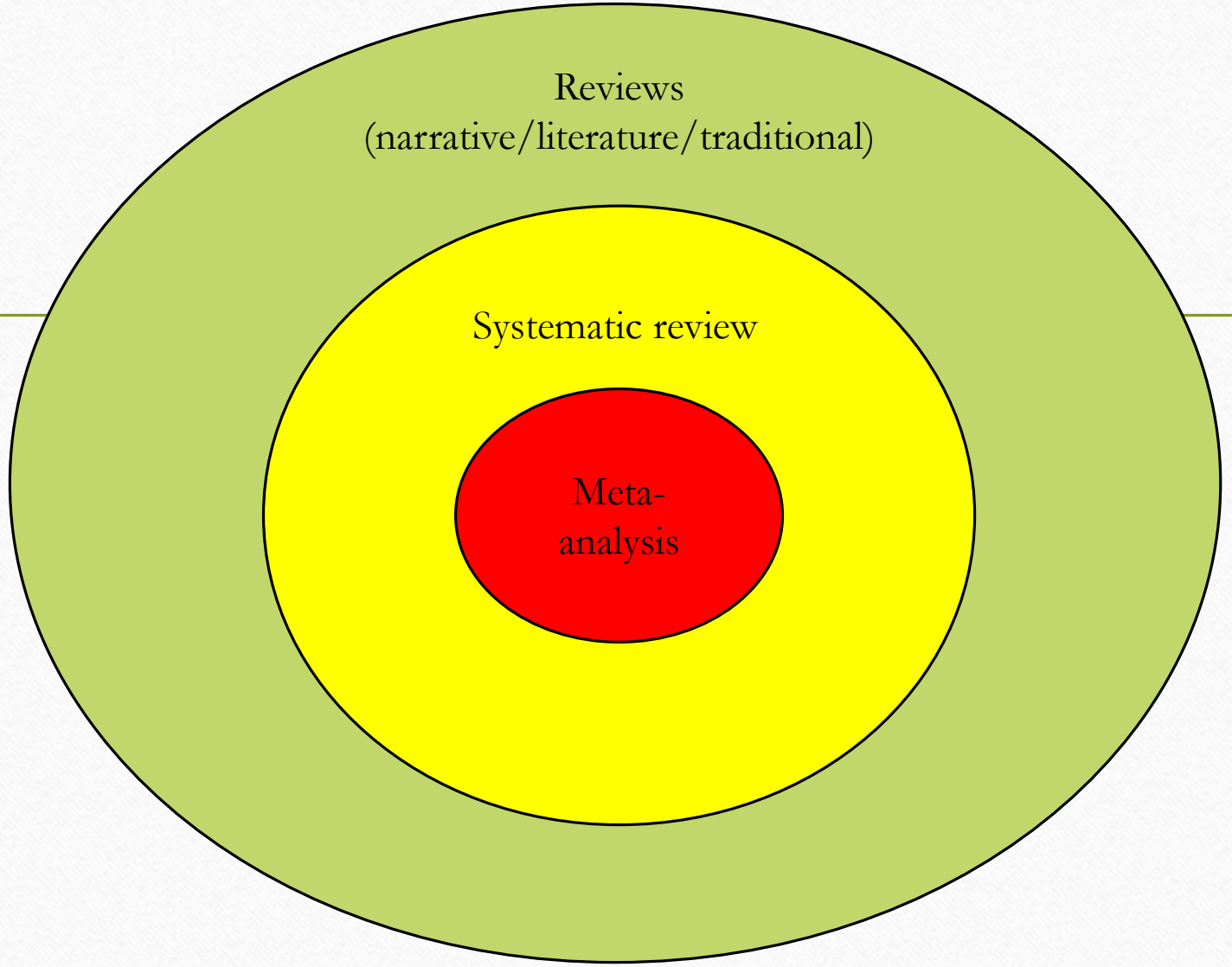
Descriptions of Types of Reviews

- **Literature review:** published materials that provide examination of recent or current literature. Can cover wide range of subjects at various levels of completeness and comprehensiveness.

- **Umbrella review:** Specifically refers to review compiling evidence from multiple reviews into one accessible and usable document

Types of reviews




Reviews
(narrative/literature/traditional)
Systematic review
Meta-
analysis

Difference between narrative review and systematic review

عنوان	مرور روایتی (Narrative review)	مرور نظام‌مند (Systematic review)
سؤال پژوهشی	سؤال پژوهشی حیطه‌ی وسیعتری را در بر می‌گیرد.	سئوال کاملاً تعریف شده، خاص و فرمول شده است.
روش شناسی	به خوبی توصیف نشده و توسط افراد مختلف به روش‌های مختلف انجام می‌شود.	روش آن مشخص و شفاف است و طبق پروتکل از قبل تعیین شده انجام می‌شود.
جستجوی مقالات	معمولاً جامع نیست و جزییات آن مشخص نیست.	جامع و شفاف شده و قابلیت تکرار پذیری دارد.
انتخاب مقالات	بستگی به تجربه، توانایی علمی و سلیقه نویسنده دارد.	بر اساس معیارهای ورود و خروج مشخص شده در پروتکل است.
ارزیابی کیفیت مقالات	متغیر است. معمولاً همه شواهدی که انتخاب شده اند، مورد بررسی قرار می‌گیرند.	فقط شواهدی که منطبق بر ملاک‌های ورود و با کیفیت انجام شده باشند، مورد بررسی قرار می‌گیرند.
استخراج داده‌ها از مقالات	روش خاصی ندارد. صرفاً توصیف ساده‌ای از یافته‌های مقالات است.	از روی فرم‌های جمع‌آوری داده‌های اختصاصی مطالعه جمع آوری شده و سعی بر جمع‌آوری یافته‌هایی که در مقاله قید نشده از محقق است.
ترکیب نتایج مقالات	ترکیب نتایج معمولاً بدون در نظر گرفتن وزن و ناهمگونی مقالات و به صورت سلیقه‌ای بوده یا اصلا انجام نمی شود.	به صورت کیفی یا کمی که در آن ترکیب نتایج از طریق فراتحلیل با لحاظ وزن هر مطالعه و با روش‌های آماری انجام می‌شود.
تفسیر نتایج	به نظرات شخص مرور کننده بستگی داشته و احتمال زیاد برای سوگرایی دارد.	بر اساس شواهد و یافته‌های مطالعات اولیه است.

Comparing example papers

- **Narrative review:**

Associations between dairy consumption and body weight: a review of the evidence and underlying mechanisms.

- **Systematic review:**

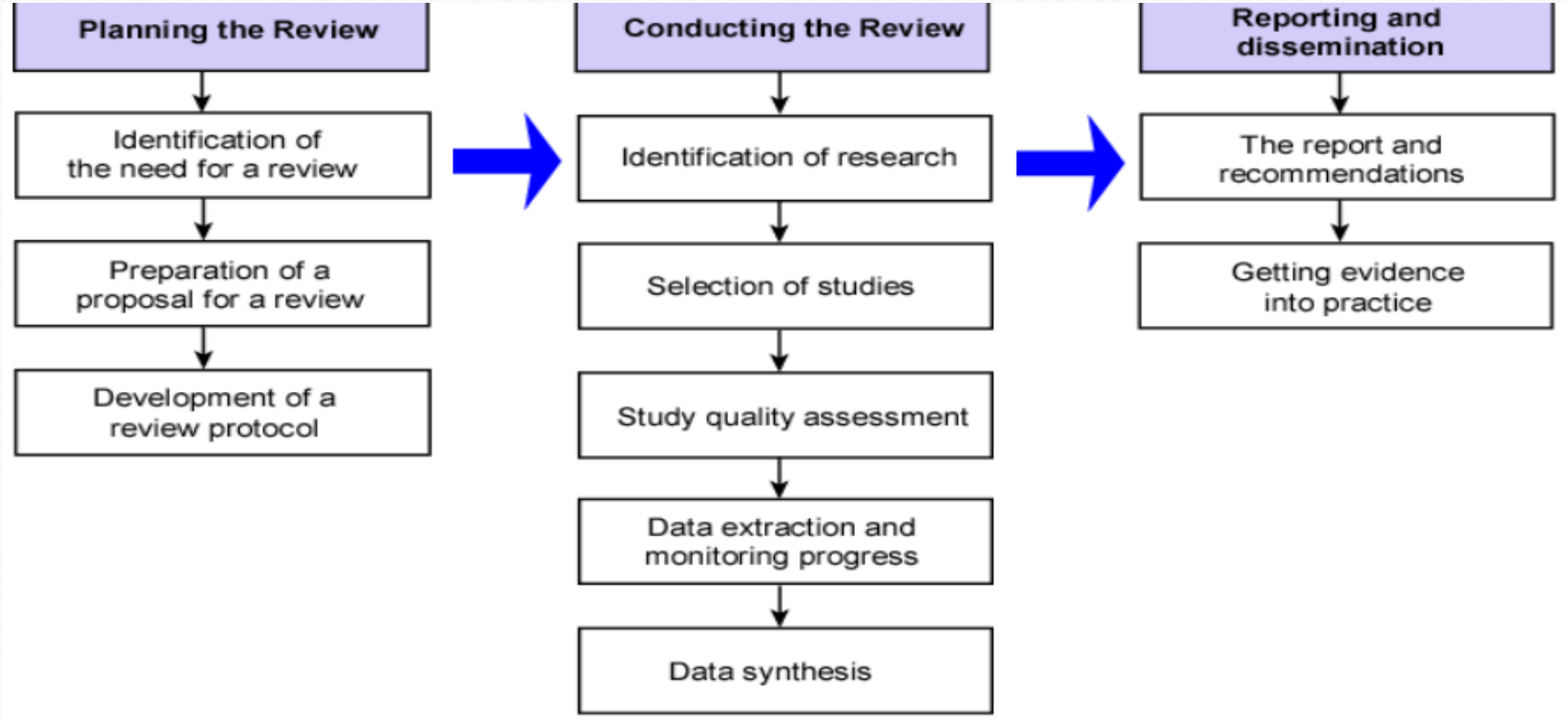
Dairy consumption and overweight and obesity: a systematic review of prospective cohort studies.

- **Systematic review and meta-analysis:**

Effect of dairy consumption on weight and body composition in adults: a systematic review and meta-analysis of prospective cohort studies.

How to conduct a **systematic review**

Stages of a systematic review



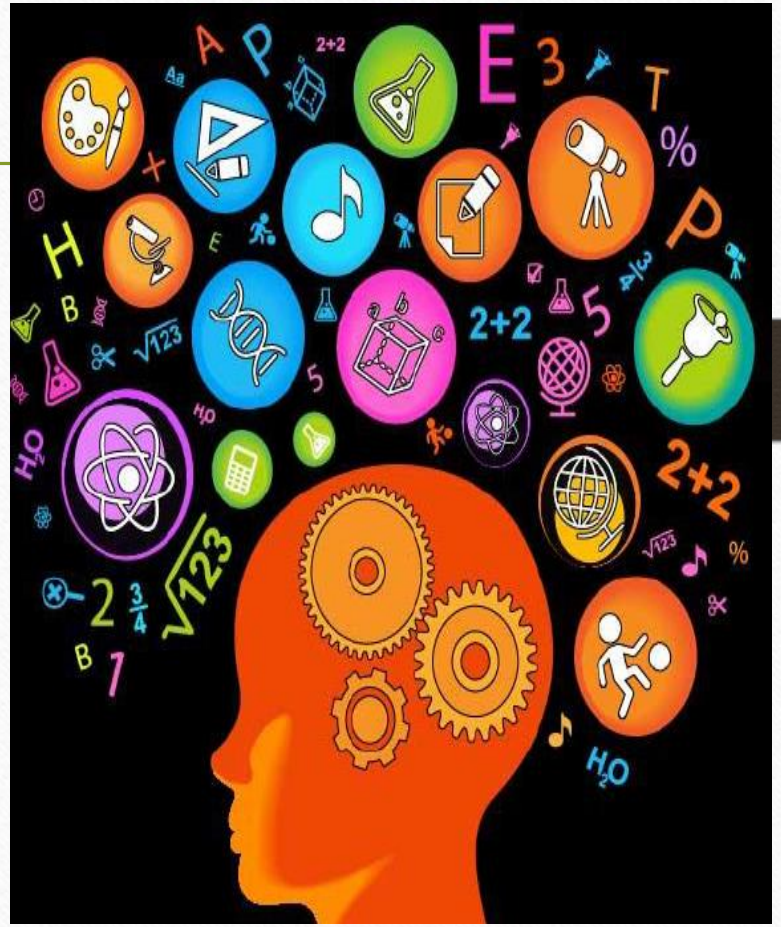
Systematic review process

1. **Well formulated question**
2. **Comprehensive data search**
3. **Identification and selection process**
4. **Critical appraisal of data**
5. **Synthesis of data**
6. **Interpretation of results**

1. Well formulated question

Question components : PICO(S)

- What types of **P**articipants?
- What types of **I**nterventions?
- What types of **C**omparisons?
- What types of **O**utcomes?
- What types of **S**tudies?



P: Patients

-Individuals with a specific disease

-Members of a group

-Under a special setting

I: Intervention

- A special treatment or intervention
- Exposure to something

C: Comparison

- Not applicable to all questions
- Comparing two different groups
- Comparing a new method/drug with the old/standard one

O: Outcome

- Hard outcomes

-Death

-Complication/Adverse effect/effect

- Soft outcomes

-Quality of life

-Patients' satisfaction

S: Studies

- Randomized clinical trials (RCT)
- Cohort
- Case-Control
- Cross-sectional
- …..

In patients undergoing hip replacement, is the risk of post-operative infection reduced by antimicrobial prophylaxis?

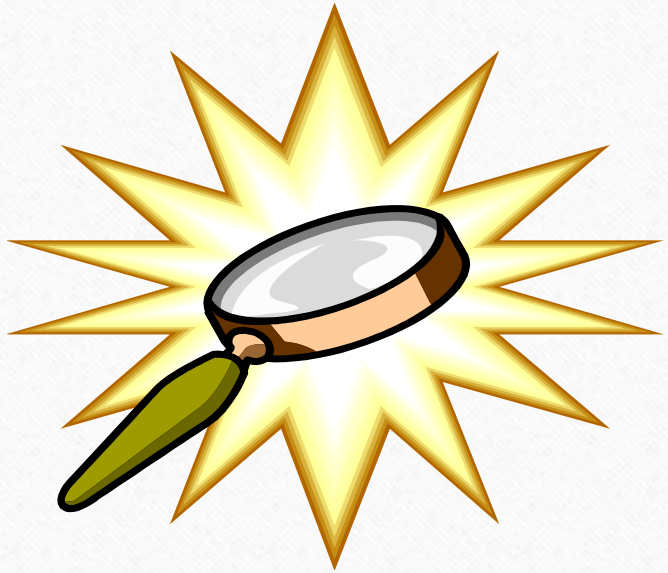
- **Patients:** Patients undergoing hip replacement
- **Intervention:** antimicrobial prophylaxis
- **Comparison**: Without prophylaxis
- **Outcome:** Post-operative infection
- **Study types:** RCTs

Are mass media interventions (or school-based or community-based) effective in preventing smoking in young people?

Problem, population	Intervention	Comparison	Outcome	Types of studies
Young people under 25 years of age	a) Television b) Radio c) Newspapers d) Bill boards e) Posters f) Leaflets g) Booklets	a) No intervention	a) self-reported smoking behaviour b) Intermediate measures (intentions, attitude, knowledge, skills)	a) RCT b) Controlled before and after studies

2. Comprehensive data search

- Two basic questions:
  - Where to search for systematic reviews?
  - How to search for systematic reviews?



Where to Search

- **Bibliographic databases**

MEDLINE/PubMed

EMBASE

- **Citation databases**

Web of Science

Scopus

- **Systematic reviews databases**

The Cochrane Library

PROSPERO

Where to Search

- **Dissertations and theses databases**

CINAHL, indexes nursing dissertations.

ProQuest Dissertations & Theses Database

Great Britain and Ireland Dissertation: (www.theses.com)

German dissertations (www.dissonline.de)

- **Grey Literature**

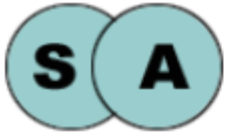
http://www.opengrey.eu/

Scholar.google.com

- **Hand searching**

Conducting a search strategy

- Boolean Operators

Shaded areas indicate retrieval	Search Statement	Types of records retrieved
	stress **AND** anxiety	Documents that have **both** stress **AND** anxiety
	stress **OR** anxiety	Documents that have **either** stress **OR** anxiety
	stress **NOT** anxiety	Documents that have stress **but NOT** anxiety

Other operators

- **Parentheses**

(Cigarette OR Smoking OR Tobacco) AND (cancer OR neoplasm OR Tumor OR Tumors)

- **Truncation (* or $) and wildcard**

Wom?n OR wom?n

Transplant*

Other operators

- **Exact**

"Spiritual health"

- **Tags**

-All filed> [tw]> [tiab]> [ti]

	Boolean	Exact Phrase	Wildcard	Truncation	Proximity
Pubmed	AND, OR, NOT	"double quotes"	-	*	-
Embase	AND, OR, NOT	'single quotes'	?	*	NEAR/n NEXT/n
Scopus	AND, OR, AND NOT	"double quotes"	?	*	W/n Pre/n
Web of Science	AND, OR, NOT	"double quotes"	?	* OR $	NEAR/x SAME

Example: Mass media interventions to prevent smoking in young people

- P= Young people

STEP ONE: Find MeSH and text words to describe young people

MeSH: Adolescent

Child

Textwords:

Adolescent	Girl
Child	Boy
Juvenile	Teenager
Young people	Young adult
Student	Youth

P = YOUNG PEOPLE

MeSH

.....
.....
.....

OR

Textwords

.....
.....
.....

P

AND

I = MASS MEDIA

MeSH

.....
.....
.....

OR

Textwords

.....
.....
.....

I

AND

C = (if required)

C

AND

O = PREVENTION OF SMOKING

MeSH

.....
.....
.....

OR

Textwords

.....
.....
.....

O

Effect of dairy on weight: a systematic review and meta-analysis of randomized controlled clinical trials

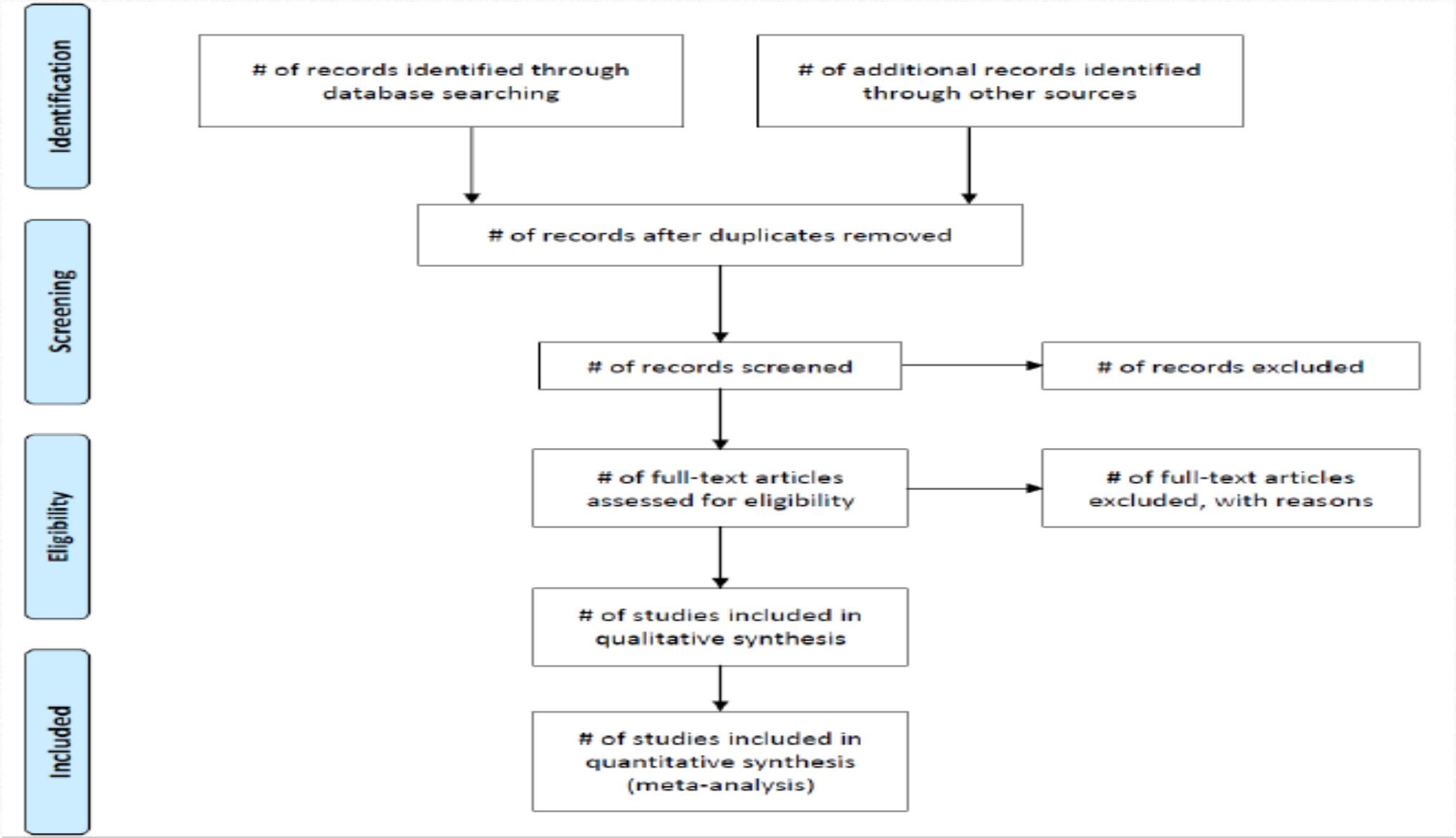
---

("dairy products"[Mesh] OR "dairy products"[tiab] OR "milk"[tiab] OR "calcium"[tiab] OR "cheese"[tiab] OR "yogurt"[tiab]) AND ("weight loss"[Mesh] OR "weight reduce"[tiab] OR "weight reducing"[tiab] OR "weight gain"[tiab] OR "weight change"[tiab] OR "weight maintenance"[tiab] "weight decrease"[tiab] OR "fat loss"[tiab] OR "fat mass"[tiab] OR "adiposity"[tiab] OR "obesity"[tiab] OR "body composition"[tiab] OR "BMI"[tiab] OR "body mass index"[tiab]) AND ("Intervention Studies" [MESH] OR "intervention"[tiab] OR "controlled trial"[tiab] OR "randomized"[tiab] OR "randomised"[tiab] OR "random"[tiab] OR "randomly"[tiab] OR "placebo"[tiab] OR "assignment"[tiab])

3. Identification and selection process

- **PRISMA flow diagram**

❑ The flow diagram depicts the flow of information through the different phases of a systematic review. It maps out the number of records identified, included and excluded, and the reasons for exclusions.


Identification
Screening
Eligibility
Included
# of records identified through database searching
# of additional records identified through other sources
# of records after duplicates removed
# of records screened
# of records excluded
# of full-text articles assessed for eligibility
# of full-text articles excluded, with reasons
# of studies included in qualitative synthesis
# of studies included in quantitative synthesis (meta-analysis)

4. Critical appraisal of data

The process of systematically examining research evidence to assess its validity, results and relevance before using it to inform a decision.

Quality assessment tool

- Selection bias
- Allocation bias
- Confounding
- Blinding (detection bias)
- Data collection methods
- Withdrawals and drop-outs
- Statistical analysis
- …….

Examples of quality assessment tools

- The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses (http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp)

- The Cochrane Collaboration's tool for assessing risk of bias in randomised trials (https://handbook-5-1.cochrane.org/chapter_8/table_8_5_a_the_cochrane_collaborations_tool_for_assessing.htm)
- Jada Scores (Quality assessment of RCTs studies)
- NIH
- …..

5. Synthesis of data

- Meta-Analysis of Quantitative Research
- Meta-synthesis of Qualitative Research

6. Interpretation of results

Structure of review articles

Structure of review articles

- **Literature reviews are in reality a type of research**

- i.e., Abstract, Introduction, Methods, Results, Discussion, and References

Structured Abstract

- **Background**
  - A description of what prompted the review
  - Presentation of a context for the review
- **Objective**
  - The author should clearly state the purpose of the article
- **Methods**
  - A description of the methods used
- **Results**
  - Summary of what the review contributes to the literature
- **Conclusion**
  - What new conclusion can be drawn as a result of the synthesis of the literature

Introduction

- Presents the background and context of the problem that inspired review
- A description of the course of the disease, common outcomes and treatment options
- The topic should be clearly defined
- Novel terms should be defined
- A synopsis of existing research
- The importance and need for the review should be established by showing
- A focused and well-constructed question should be present

Methods

- Describes the search process and strategies involved, including:
  - Databases searched
  - Search terms
  - Search limits e.g., publication years, languages, etc.

- Should include enough detail to enable others to replicate the search

Methods

- The criteria that were used to include or exclude studies
- How the data were extracted and synthesized
- Quality assessment
- Statistical analysis

Results

- The outcome of the search process is presented
- How many articles were excluded from the review and which of the inclusion criteria they failed to meet
- The characteristics of the included studies may be described and contrasted in this section
- Statistical findings

Discussion

- ❑ The findings of all of the articles in the review
- ❑ Information about the etiology, pathophysiology, diagnosis, treatment, and prognosis of the condition at issue is often provided
- ❑ Comparison of our results with other published reviews
- ❑ Appraisal of current review
- ✓ Limitations
- ✓ Strengths

http://www.prisma-statement.org/

Checklist of items to include when reporting a systematic review or meta-analysis

Section/topic	#	Checklist item
TITLE		
Title	1	Identify the report as a systematic review, meta-analysis, or both.
ABSTRACT		
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.
INTRODUCTION		
Rationale	3	Describe the rationale for the review in the context of what is already known.
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).

METHODS		
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).

Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.

RESULTS		
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and confidence intervals, ideally with a forest plot.
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).

DISCUSSION		
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers).
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.
FUNDING		
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.


Preparation of a systematic review is a
team work

از توجه شما سپاسگزارم

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