Introduction to Systematic Review
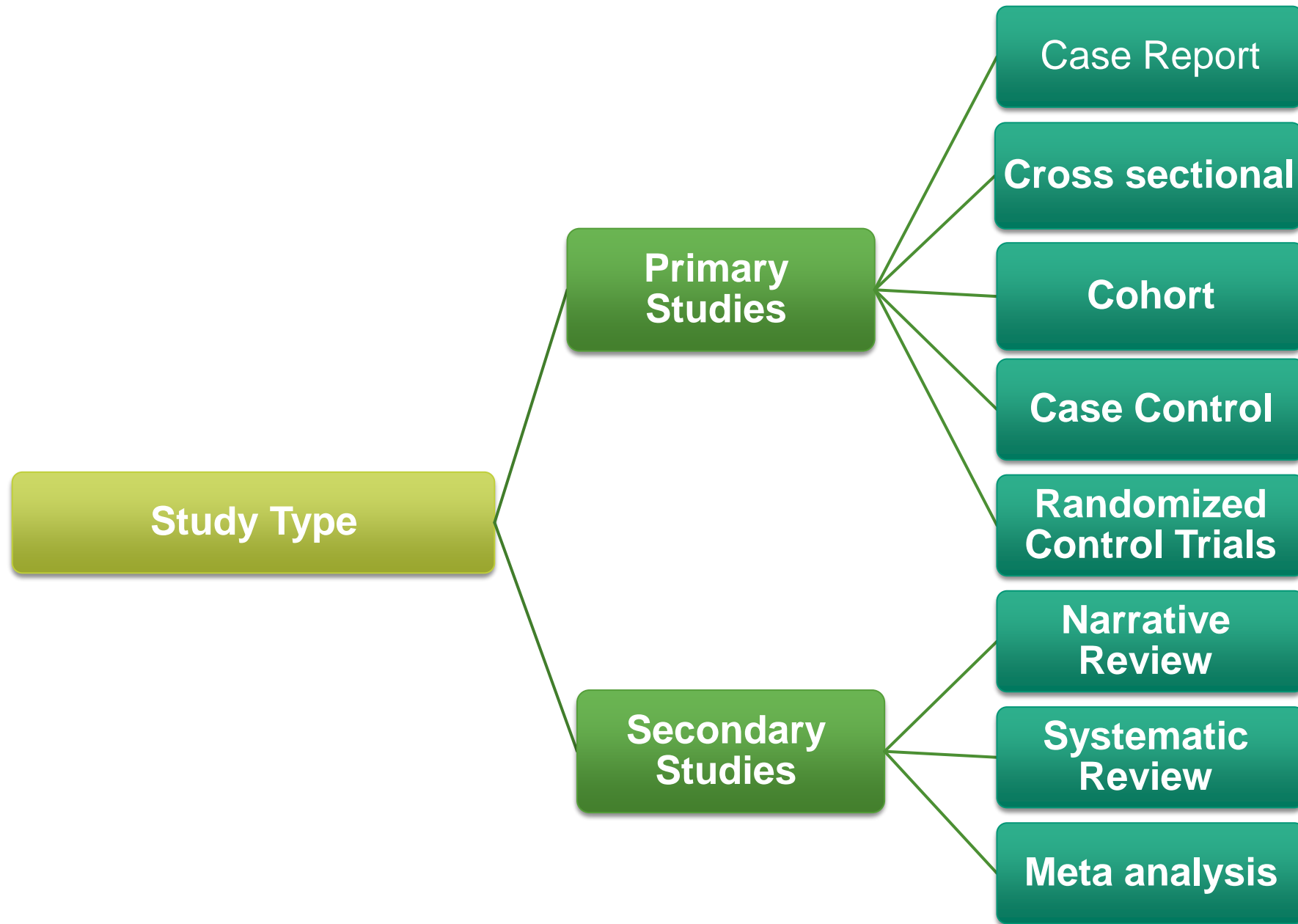
By A. Davoudian

Zanjan University of Medical Sciences

Khordad 1401

Define the question (PICO)

Question Components: **PICOS**

➢ What types of **P**articipant?

➢ What types of **I**nterventions?

➢ What types of **C**omparison?

➢ What types of **O**utcomes?

➢ What types of **S**tudy?

Suggested Types of Studies to Answer Clinical Questions

Type of Question	Best Types of Studies
Therapy	RCT
Prevention	RCT, Cohort, Case Control, Case Series
Etiology/Harm	RCT, Cohort, Case Control, Case Series
Prognosis	Cohort, Case Control, Case Series
Diagnostic Test	Prospective, blind comparison compared to the gold standard
Quality of Life	Qualitative studies (observation, interviews, narratives, questionnaires, analysis of documents …)

Systematic Review

Randomized Control Trials

Cohort

Case Control Studies

Case Series, Case Reports

Editorial, Expert Opinion

PICOS Sample

In Patients With Chronic Kidney Disease, do SGLT2 Inhibitors has an effect on Renal Outcomes such as composite of worsening kidney function, end-stage kidney disease (ESKD), or renal death?

> **P**articipant   Patients With Chronic Kidney Disease

> **I**nterventions   SGLT2 Inhibitors

> **C**omparison   Placebo, Other treatment …

> **O**utcomes   Renal Outcomes

> **S**tudy   Randomized Controlled Trial

PICOS Sample

Effectiveness of favipiravir in COVID-19?

➢ **P**articipant   Patients With COVID-19

➢ **I**nterventions   favipiravir

➢ **C**omparison   Placebo, Other treatment

➢ **O**utcomes   treatment or reduce complication

➢ **S**tudy   Randomized Controlled Trial

PICOS Sample

Association of Occupational Lead Exposure and Brain Tumors?

➤ **P**articipant   Patient with Brain Tumors

➤ **E**xposure   Lead compound

➤ **C**omparison   Not exposed population

➤ **O**utcomes   Association

➤ **S**tudy   Case control, Cohort

PICOS Sample

Incidence of Pressure Injuries in patients undergoing surgery

- **P**articipant — Patient undergoing surgery

- **E**xposure — Not applicable

- **C**omparison — Not applicable

- **O**utcomes — Incidence

- **S**tudy — Cross-sectional, Case control, Cohort

Has anybody done this before?

➢ PubMed

➢ Tripdatabase.com

➢ Cochrane.org

➢ Prospero

Pub Med.gov

Search

Advanced

PubMed® comprises more than 33 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.

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tripdatabase.com

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Trip medical database
A smart, fast tool to find high quality clinical research evidence

Search   PICO   Advanced Pro   Recent Pro

really makes the Trip experience even better

Trip `Free`

Search   **PICO**   Advanced `Pro`   Recent `Pro`

Population

e.g. diabetics

Intervention

e.g. a treatment, diagnostic test

Comparison

any comparison intervention

🔍 Search

Outcome

e.g. mortality, blood pressure

https://www.cochranelibrary.com/advanced-search

Cochrane Library

Trusted evidence.
Informed decisions.
Better health.

Cochrane Reviews ▼   Trials ▼   Clinical Answers ▼   About ▼   Help ▼   About Cochrane ▶

Advanced Search

| Search | Search manager | Medical terms (MeSH) | **PICO search** |

About   ? Search help

Enter a search term and select a PICO vocabulary term from the dropdown

| Enter a search term | Lookup ▼ |

+   Clear All   Run search

Scoping Search

Are there enough primary studies on my topic?

➢ Learn to better describe your topic

➢ Develop search term list

Creating Concept Table
by Mesh

NIH〉 National Library of Medicine
National Center for Biotechnology Information

Log in

MeSH

| MeSH ∨ | chronic kidney disease |

⊗ **Search**

Limits   Advanced

Help

Full ▾

Send to: ▾

Renal Insufficiency, Chronic

Conditions in which the KIDNEYS perform below the normal level for more than three months. Chronic kidney insufficiency is classified by five stages according to the decline in GLOMERULAR FILTRATION RATE and the degree of kidney damage (as measured by the level of PROTEINURIA). The most severe form is the end-stage renal disease (CHRONIC KIDNEY FAILURE). (Kidney Foundation: Kidney Disease Outcome Quality Initiative, 2002)
Year introduced: 2006

PubMed search builder options
Subheadings:

☐ analysis
☐ anatomy and histology
☐ blood
☐ cerebrospinal fluid
☐ chemically induced
☐ classification
☐ complications
☐ congenital
☐ cytology
☐ diagnosis

☐ enzymology
☐ epidemiology
☐ ethnology
☐ etiology
☐ genetics
☐ history
☐ immunology
☐ metabolism
☐ microbiology
☐ mortality

☐ pharmacology
☐ physiology
☐ physiopathology
☐ prevention and control
☐ psychology
☐ radiotherapy
☐ rehabilitation
☐ statistics and numerical data
☐ surgery
☐ therapy

PubMed Search Builder

Add to search builder   AND ∨

Search PubMed

You Tube Tutorial

Related information
PubMed

PubMed - Major Topic

Clinical Queries

NLM MeSH Browser

dbGaP Links

MedGen

Concept table

MY PICO	Chronic Kidney Disease	SGLT2 Inhibitors
Mesh Terms	Renal Insufficiency, Chronic	Sodium-Glucose Transporter 2 Inhibitors
Text words	- Chronic Renal Insufficiencies - Renal Insufficiencies, Chronic - Chronic Renal Insufficiency - Kidney Insufficiency, Chronic - Chronic Kidney Insufficiencies - Kidney Insufficiencies, Chronic - Chronic Kidney Diseases - Kidney Diseases, Chronic - Chronic Renal Disease - Renal Diseases, Chronic …	- Sodium Glucose Transporter 2 Inhibitor - Sodium Glucose Transporter 2 Inhibitors - Gliflozins - SGLT2 Inhibitors - SGLT-2 Inhibitor - Inhibitor, SGLT2 ….

Concept table

MY PICO	COVID 19	Favipiravir
Mesh Terms	COVID-19	Favipiravir
Text words	▪ COVID 19 ▪ SARS-CoV-2 Infection ▪ SARS-CoV-2 Infections ▪ 2019 Novel Coronavirus Infection ▪ 2019-nCoV Disease ▪ COVID-19 Virus Infection ▪ Virus Infection, COVID-19 ▪ Coronavirus Disease 2019 …	▪ T-705 cpd ▪ Avigan ▪ Cytovex

Where to Search?

Core Biomedical Databases

Specialized Databases
(Subjects Specified Databases)

➢ Biological Abstracts

➢ International Pharmaceutical Abstract (IPA)

➢ PsycInfo

➢ Chemical Abstracts

➢ CINAHL (nursing and allied health)

➢ Toxnet

➢ ERIC (Education Resources Information Center) & …

Biases in Systematic Review (Publication Bias)

➢ The studies are more likely to be submitted for publication and published quickly

❑ 1) if they had reached sig.

❑ 2) positive result

❑ 3) interesting results for both reviewers & authors!

❑ 4) language bias (ENG) in being included in a meta analysis.

How to Bypass Publication Bias

- ➤ Searching Registries
- ➤ Conference Papers
- ➤ Searching Libraries for Thesis & Research Reports
- ➤ Searching Grey Literature

CENTRAL

➤ **CENTRAL:** The Cochrane Central Register of Controlled Trials (CENTRAL) is a key resource for those preparing and maintaining systematic reviews.

CENTRAL includes citations from MEDLINE, EMBASE, as well as other published and unpublished sources including CINAHL, ClinicalTrials.gov and the WHO's International Clinical Trials Registry Platform

https://www.cochranelibrary.com/central

Registries Web Sites for RCTs

➤ **http://www.clinicalstudyresults.org**

➤ **http://www.isrctn.com/**

➤ Australian New Zealand Clinical Trials Registry:
http://www.anzctr.org.au/trialSearch.aspx

➤ Netherlands Trial Registry: **http://www.trialregister.nl**

➤ Iranian Registry of Clinical Trials: **https://irct.ir/**

➤ World Health Organization International Clinical Trials Registry Platform:
http://www.who.int/ictrp

Registries Web Sites for RCTs

➢ US National Institutes of Health collection of clinical studies sponsored by the NIH, other Federal agencies, the pharmaceutical industry, and nonprofit organizations in the United States. **http://clinicaltrials.gov/**

➢ GlaxoSmithKline Clinical Study Register:

 http://www.gsk-clinicalstudyregister.com/

➢ Centerwatch Lists recruiting trials with information for patients as well as professionals. **http://www.centerwatch.com**

COVID-19 Information

Public health information (CDC) | Research information (NIH) | SARS-CoV-2 data (NCBI) | Prevention and treatment information (HHS) | Español

NIH〉 U.S. National Library of Medicine

ClinicalTrials.gov

Find Studies ▾   About Studies ▾   Submit Studies ▾   Resources ▾   About Site ▾   PRS Login

ClinicalTrials.gov is a database of privately and publicly funded clinical studies conducted around the world.

Explore 396,768 research studies in all 50 states and in 220 countries.

See listed clinical studies related to the coronavirus disease (COVID-19)

Find a study (all fields optional)

Status

◯ Recruiting and not yet recruiting studies

⬤ All studies

https://clinicaltrials.gov/

https://www.who.int/clinical-trials-registry-platform

World Health Organization

Health Topics | **Countries** ˅ | **Newsroom** ˅ | **Emergencies** ˅ | **Data** ˅ | **About WHO**

ICTRP Search Portal

The ICTRP Search Portal aims to provide a single point of access to information about ongoing and completed clinical trials. It provides a searchable database containing the trial registration data sets made available by data providers around the world meeting criteria for content and quality control.

Trial registration data sets are available on the ICTRP Search Portal in English only. Some data providers, however, may also store trial registration data sets in other languages. If available, these may be searched by going directly to the web sites of the individual registries. It is possible to search for trials registered in certain Primary Registries in the following languages:

‹ **International Clinical Trials Registry Platform (ICTRP)**

ICTRP search portal ˅

ICRTP Registry Network ˅

- **Chinese** - Chinese Clinical Trial Registry (ChiCTR))
- **Dutch** - The Netherlands National Trial Register (NTR)
- **German** – German Clinical Trials Register (DRKS)
- **Japanese** – Japan Primary Registries Network (JPRN)
- **Korean** – Clinical Research Information Service (CRiS), Republic of Korea
- **Persian** – Iranian Registry of Clinical Trials (IRCT)

https://www.who.int/clinical-trials-registry-platform/the-ictrp-search-portal

Conference Papers

➢ Can be found on:

➢ **Scopus**

➢ **Conference Proceedings Citation Index- Science (CPCI-S)**

➢ **Conference Proceedings Citation Index Social Science & Humanities (CPCI-SSH)**

  ❑ both available via Thomson Reuter's **Web of Science**.

  ❑ They include reports from conferences, symposia, seminars, workshops.

Source title ⌄

Keyword ⌄

Affiliation ⌄

Funding sponsor ⌄

Country/territory ⌄

Source type ⌃

☐ Journal (199,083) >

☐ Book (1,730) >

☐ Book Series (1,172) >

☐ Conference Proceeding (497) >

☐ Trade Journal (97) >

☐ Undefined (290) >

Language ⌄

Limit to   Exclude

→] Export refine

View abstract ⌄   View at Publisher   Related documents

23,100106

☐ 9   Fibroblast growth factor-23 and subclinical markers of cardiac dysfunction: The coronary artery risk development in young adults (CARDIA) study | Akhabue, E., Wong, M., Mehta, R., (...), Gutierrez, O.M., Carnethon, M. | 2022 | American Heart Journal 245, pp. 10-18 | 0

View abstract ⌄   View at Publisher   Related documents

☐ 10   Uremic leontiasis ossea: distinctive imaging features allow differentiation from other clinical causes of leontiasis ossea | Alamer, A. | 2022 | Radiology Case Reports 17(3), pp. 553-557 | 0

View abstract ⌄   View at Publisher   Related documents

☐ 11   Assessing and counteracting fibrosis is a cornerstone of the treatment of CKD secondary to systemic and renal limited autoimmune disorders | de Cos, M., Xipell, M., García-Herrera, A., (...), Cervera, R., Quintana, L.F. | 2022 | Autoimmunity Reviews 21(3),103014 | 0

View abstract ⌄   View at Publisher   Related documents

☐ 12   Hyperphosphatemia-induced degradation of transcription factor EB exacerbates vascular | Ishiwata, R., Morimoto, Y. | 2022 | Biochimica et Biophysica Acta - Molecular Basis of | 0

Basic Search   Author Search [BETA]   Cited Reference Search   Advanced Search

Example: oil spill* mediterranean   ⊗ | Topic ▼ | **Search**   Search tips

+ Add row | Reset

Timespan

| All years (1975 - 2022) ▼ |

More settings ▲

Web of Science Core Collection: Citation Indexes

☑ Science Citation Index Expanded (SCI-EXPANDED) --1980-present

☑ Social Sciences Citation Index (SSCI) --1980-present

☑ Arts & Humanities Citation Index (A&HCI) --1975-present

☑ Conference Proceedings Citation Index- Science (CPCI-S) --1990-present

☑ Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) --1990-present

☑ Book Citation Index– Science (BKCI-S) --2005-present

☑ Book Citation Index– Social Sciences & Humanities (BKCI-SSH) --2005-present

☑ Emerging Sources Citation Index (ESCI) --2005-present

Auto-suggest publication names

(The Autosuggest service is not available.)

Default Number of Search Fields to Display

| 1 field (Topic) ▼ |

(To save these permanently, **sign in** or **register**.)

Theses and Dissertations

➤ **Dissertation Abstracts** lists American dissertations accepted at accredited institutions 1861 onwards; Masters theses have been included since 1962; and since 1988, the database includes citations for dissertations from 50 British universities: **http://www.proquest.com**

➤ Some databases e.g. **CINAHL** and **PsycInfo** include dissertations

➤ WorldCat dissertations and Theses **(OCLC)** can be accessed via King's databases page

➤ British Library's eThos contains over 500,000 doctoral theses: **http://ethos.bl.uk**

ProQuest

You are searching 2 databases

Basic Search   Advanced Search   Publications   Change Databases (2)

All   Scholarly Journals   Books   Videos & Audio   Dissertations & Theses   All source types ▾

Enter search terms...

☐ Full text   ☐ Peer reviewed ⓘ   Search tips

https://www.proquest.com/

English

Basic search   Advanced search   Browsing   Search history

BASE

Bielefeld Academic Search Engine

Search 311,977,910 documents from 10,152 content providers

https://www.base-search.net/

Grey literature

➢ **Grey** is between White & Black! "There are many definitions of grey literature, but it is usually taken to mean **literature that is not formally published in sources such as books or journal articles**." (Cochrane Handbook, 2011)

- ❑ E.g. Doctoral dissertations

- ❑ Technical or research reports from government agencies

- ❑ Reports from scientific research groups

- ❑ Working papers from research groups or committees

- ❑ Some conference proceedings and official publications

Grey literature

◆ Governmental research, e.g., National Technical Reports Library at: **http://projectreporter.nih.gov**

◆ Grey Literature Report at: **http://www.greylit.org**

◆ **Google or Google Scholar**

◆ GreySource at: **http://www.greynet.org**

◆ Directory of Open-Access repositories: **www.opendoar.org**

Grey Literature Report
Fill the gaps in your public health research

THE NEW YORK ACADEMY OF MEDICINE
HEALTHY CITIES. BETTER LIVES.

HOME   **CURRENT REPORT**   **WHAT IS GREY LITERATURE?**   **SUBSCRIBE**   **PUBLISHERS LIST**   **FAQ/HELP**

www.greylit.org >

Search the Report

Chronic Kidney Disease   **Search**

8 results for *Chronic Kidney Disease*
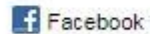
Facebook   Twitter   Print   Bookmark   RSS   Download

Sort By: Author   Title   Publisher   Date of Publication   **Catalog Date**

Title: Diabetes-related mortality in New York City

Publisher: New York City, Department of Health and Mental Hygiene

Date of Publication: 2013

Refine your search   reset

Search Within

- Full Text
- Author
- Title
- Summary
- Publisher
- Subject

Reports To Search

- All
- Current

Additional Keywords

Date Added To Database:

http://www.greylit.org/

Searching Guide
building search strategy

Boolean Logics

Shaded areas indicate retrieval

Search Statement

Types of records retrieved

Stress **AND** Depression

Documents that have **both** Stress **AND** Depression

Cancer **OR** Neoplasm

Documents that have **either** Cancer **OR** Neoplasm

Stress **NOT** Anxiety

Documents that have Stress **but NOT** Anxiety

Truncation & Wildcard Characters

Symbol	Retrieves	Example
*	Zero or more characters	Hydroxy* = Hydroxylase Hydroxydoparnine Hydroxyethyl
?	One character only	analy?e = analyze analyse
$	Zero or one character	Eight$ = eight eighty

Limits & Filters

➢ Age group

➢ Publication date ranges

➢ Species (human or animal)

➢ Languages

➢ Publication type (reviews, clinical trials, cohort, etc.)

➢ …

Abstract

☐ Free full text

☐ Full text

ARTICLE ATTRIBUTE

☐ Associated data

ARTICLE TYPE

☐ Books and Documents

☐ Clinical Trial

☐ Meta-Analysis

☐ Randomized Controlled Trial

☐ Review

☐ Systematic Review

PUBLICATION DATE

○ 1 year

○ 5 years

○ 10 years

○ Custom Range

Additional filters

Page 1

2

Cite

Share

patients with type **2** diabetes mellitus and **chronic kidney disease**: A syste review and meta-analysis.

Toyama T, Neuen BL, Jun M, Ohkuma T, Neal B, Jardine MJ, Heerspink HL, Wong MG, Ninomiya T, Wada T, Perkovic V.

Diabetes Obes Metab. 2019 May;21(5):1237-1250. doi: 10.1111/dom.13648. Epub 2019 Mar 4.

PMID: 30697905   Free article.

AIM: The use of **sodium glucose** co-**transporter 2** (**SGLT2**) **inhibitors** in patients with type **2** diabetes mellitus (T2DM) and **chronic kidney disease** (CKD) has been limited, primarily because glycaemic efficacy is dep ...

3

Cite

Share

☐ Effects of dapagliflozin on major adverse **kidney** and cardiovascular events in patients with diabetic and non-diabetic **chronic kidney disease**: a prespecified analysis from the DAPA-CKD trial.

Wheeler DC, Stefánsson BV, Jongs N, Chertow GM, Greene T, Hou FF, McMurray JJV, Correa-Rotter R, Rossing P, Toto RD, Sjöström CD, Langkilde AM, Heerspink HJL; DAPA-CKD Trial Committees and Investigators.

Lancet Diabetes Endocrinol. 2021 Jan;9(1):22-31. doi: 10.1016/S2213-8587(20)30369-7.

PMID: 33338413   Clinical Trial.

BACKGROUND: Dapagliflozin reduces the risk of **kidney** failure and heart failure in patients with **chronic kidney disease**. We aimed to investigate the effects of dapagliflozin on **kidney**, cardiovascular, and mortality outcomes according to presence ...

4

Cite

Share

☐ Sotagliflozin in Patients with Diabetes and **Chronic Kidney Disease**.

Bhatt DL, Szarek M, Pitt B, Cannon CP, Leiter LA, McGuire DK, Lewis JB, Riddle MC, Inzucchi SE, Kosiborod MN, Cherney DZI, Dwyer JP, Scirica BM, Bailey CJ, Díaz R, Ray KK, Udell JA, Lopes RD, Lapuerta P, Steg PG; SCORED Investigators.

N Engl J Med. 2021 Jan 14;384(2):129-139. doi: 10.1056/NEJMoa2030186. Epub 2020 Nov 16.

Back to

Systematic search

1. Scoping Search
2. Identify key concepts
3. Identify search terms
4. Identify databases
5. Build search strategies
6. Apply study design filters and topic hedges
7. Search outside of published literature

Validating and Verifying your search

➢ Cited reference list

➢ Citing reference list

➢ Author search

Documenting Search Strategies

◆ The systematic review process should be transparent and replicable. Document each search including:

❑ Name of database

❑ Date search was run (month, day, year)

❑ Years covered by the search

❑ Complete search strategy used, including all search terms

❑ Limits (if any)

❑ Results

Documenting Search Strategies

◆ **DATABASE/VENDOR**

➢ *Pubmed*

◆ **DATE**

➢ *…. –2021; last searched December 05, 2021*

◆ **LANGUAGE**

➢ *No limitation*

◆ **Total**

➢ *799*

◆ **Strategy**

➢ *Exact search strategy. Should be replicable*

Select the Studies

Selecting studies

◆ **Export all citations to a citation manager (EndNote, …)**

◆ **De-duplicate records, keeping track of original numbers found, duplicates, and numbers kept after de-duplicating**

◆ **Screen the title/abstract using inclusion/exclusion criteria**

◆ **Obtain full-text of possibly relevant citations**

◆ **Screen a second time by full-text. Record reasons for each excluded study**

◆ **Appraise the Quality of Studies**

A Good Reference

➤ Cochrane Handbook for Systematic Reviews of Interventions

Available at: ***https://training.cochrane.org/handbook***