# Unit 7: Databases, Portals, and Artificial Intelligence

## Unit 7: Databases, Portals, and Artificial Intelligence

# **Learning Goals**

By the end of this unit, you will be able to:

- Choose the right scholarly database for a given research need and construct efficient searches using field tags and controlled vocabularies.
- Use Indian AYUSH-specific portals (AYUSH Research Portal, NAMASTE) to locate evidence and code morbidity data for service and research use.
- Apply **Artificial Intelligence (AI)** tools safely for searching, screening, summarising, and organising literature—while avoiding ethical and methodological pitfalls.

# 1) Why databases and portals matter

High-quality research begins with finding the **right evidence at the right place**. General web search is noisy and biased. Scholarly databases curate and index content with rich metadata; portals aggregate **specialty content** (e.g., AYUSH trials, morbidity codes) that you may not find quickly elsewhere. For BAMS coursework and dissertations, using the **appropriate database/portal** saves time, improves the rigour of your review, and helps align your work with **Evidence-Based Medicine (EBM)** and national priorities.

# 2) Core scholarly databases (what, when, how)

## 2.1 PubMed (MEDLINE and more)

**What it is:** The world's largest free biomedical citation database managed by the U.S. National Library of Medicine (NLM). It indexes MEDLINE journals and other life-science records; many citations link to full text in PubMed Central or publishers.

**When to use:** Most clinical, epidemiological, and basic research questions; near-universal starting point for health topics, including Ayurveda-related clinical outcomes reported in mainstream journals.

### How to search well

- Use MeSH (Medical Subject Headings) to capture synonyms (e.g., "Osteoarthritis, Knee"). Combine MeSH with text words for recent, not-yet-indexed items.
- Use field tags: ayurveda[tiab] AND osteoarthritis[MeSH] AND randomized[Title/Abstract].
- Narrow with filters (article type, study design, age, language) but beware of over-restricting.

### 2.2 Scopus

**What it is:** A large subscription-based abstract and citation database (Elsevier) covering medicine, science, social science, books, and conference proceedings; curated by an independent **Content Selection Advisory Board**. Besides discovery, it offers **citation analytics**, author profiles, and journal metrics.

#### When to use:

- Mapping a field (who publishes, where, and how often).
- Tracking citations and h-index for promotion dossiers.
- Identifying related records beyond MEDLINE coverage (e.g., conference papers or book chapters relevant to Ayurveda health services).

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Tip: Use source filters to avoid predatory journals; export RIS/CSV for reference managers.

## 2.3 Cochrane Library / CENTRAL

What it is: A collection that includes the Cochrane Database of Systematic Reviews (CDSR) and the Cochrane Central Register of Controlled Trials (CENTRAL)—a curated index of randomised trials compiled from multiple sources.

#### When to use:

- To find high-quality systematic reviews for clinical decisions.
- To identify trials (including those not easily found by topic words in PubMed) via CENTRAL.

**How to search:** Use simple PICO terms; check "Trials" tab; scan **Inclusion criteria** and "Risk of bias" in Cochrane Reviews to understand quality.

## 2.4 Other helpful sources (snapshot)

- Google Scholar: broad coverage, good for grey literature; de-duplicate results carefully.
- DOAJ (Directory of Open Access Journals): check if an open-access journal is legitimate.
- Clinical trial registries: for prospectively registered studies (e.g., trial IDs you can later verify in manuscripts).
- Subject-specific indexes (e.g., Embase via subscription) can add pharmacology depth and European coverage.

# 3) AYUSH-specific portals (India)

## 3.1 AYUSH Research Portal (ARP)

What it is: A Ministry of Ayush initiative (with CCRAS leadership) that collates research outputs across Ayurveda, Yoga & Naturopathy, Unani, Siddha, Homoeopathy, Sowa-Rigpa and allied areas. The portal supports search, browsing by system/topic, and links to CCRAS journals (JRAS/JDRAS) and compendia.

### Why use it:

- To scan **Indian evidence** quickly (theses, institute publications, and select articles) that may not be prominent in international databases.
- To understand national priorities and download compendia or e-books for background sections.

**Practical workflow:** Start in ARP to map Indian context → switch to PubMed/Scopus for global literature → return to ARP for **local comparators** and **policy-relevant** references.

# 3.2 NAMASTE Portal (National AYUSH Morbidity & Standardised Terminologies Electronic)

What it is: A national web portal to standardise AYUSH morbidity terminology and enable code-based reporting across public and private facilities. It supports dual coding—AYUSH morbidity codes and ICD-10/ICD-11—thereby linking traditional diagnoses with mainstream health information systems.

## Why it matters for research:

- Enables comparable datasets across centres (crucial for multicentre observational research and service audits).
- Facilitates reason-for-encounter and morbidity surveillance specific to AYUSH systems.
- Eases data sharing with national platforms that require ICD coding.

## Use in your project:

- When designing cohort/case-series studies, **pre-map your case definitions** to NAMASTE + ICD codes.
- In your Methods, state: "Morbidity was coded using NAMASTE (AYUSH) codes and mapped to ICD-10/11, enabling

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interoperability with hospital information systems."

# 4) Building effective searches (with Ayurveda examples)

## 4.1 Boolean logic and field tags

- Boolean: AND (narrow), OR (broaden synonyms), NOT (exclude carefully).
- Phrase searching: "low back pain".
- Field tags in PubMed: [tiab] for title/abstract; [mh] for MeSH; [au] for author; [dp] for year.

#### **Example (Ayurveda + osteoarthritis, RCTs):**

(Ayurveda[tiab] OR Abhyanga[tiab] OR Panchakarma[tiab]) AND (Osteoarthritis, Knee[mh] OR knee osteoarthritis[tiab]) AND (randomized[tiab] OR randomised[tiab])

**Refine with MeSH:** Combine **Osteoarthritis, Knee[mh]** with Massage[mesh] or **Physical Therapy Modalities[mh]** if the intervention is procedure-based.

## 4.2 Scopus analytics

Use "Analyze search results" to identify top journals, institutions, and authors—handy for selecting a target journal and spotting collaborators.

# 4.3 CENTRAL for trial discovery

When your PubMed search finds few RCTs, repeat in CENTRAL; you may capture trials indexed from non-MEDLINE sources.

## 5) Artificial Intelligence (AI): what to use, what to avoid

## 5.1 Where AI truly helps

- Query formulation: Generative AI can propose keyword lists, MeSH/Emtree candidates, and Boolean strings you then refine.
- **De-duplication and screening:** Modern review platforms use ML to prioritise likely-relevant records; you verify decisions.
- Summarisation: Draft evidence tables, pull out outcomes/time-points, and create initial summaries for each study
- Organisation: Auto-tag PDFs, extract references, and maintain a PRISMA-style audit trail.

#### 5.2 Red lines and cautions

- No "Al as author." You remain responsible for facts, reasoning, and copyright; disclose tool-use transparently (see Unit 4 on publication ethics).
- Hallucinations: Always verify citations in databases; never trust an Al-generated DOI/reference without checking.
- Privacy: Do not upload patient data or proprietary documents to public tools; if required, use institutionapproved solutions.
- Bias: ML models can amplify publication bias; countercheck with manual searches and registries.

# 5.3 A practical Al-assisted workflow (10 steps)

Draft PICO → 2) Ask AI for synonyms/MeSH → 3) Build PubMed string; test and refine → 4) Replicate in Scopus/CENTRAL → 5) Export to a reference manager → 6) Use ML-assisted screening (you confirm) → 7) Extract data into standardised forms → 8) Ask AI to summarise methods/outcomes (you verify line-by-line) → 9) Build

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**SoF (summary of findings)** table  $\rightarrow$  10) Write human, critical **Discussion** acknowledging limitations and heterogeneity.

# 6) Quick comparison tables

## 6.1 Databases and portals (what they're best for)

Resource	Best for	Unique strengths	Typical limitations
PubMed	Clinical & basic biomedical literature	Free; <b>MeSH</b> controlled vocabulary; Clinical Queries	Fewer conference/ regional items; may miss grey literature.
Scopus	Comprehensive discovery + citation analysis	Broad coverage incl. books & proceedings; analytics	Subscription; must screen for journal quality.
Cochrane Library / CENTRAL	Systematic reviews; RCT finding	Cochrane reviews; trial registry aggregation	Subscription in some settings; CENTRAL is bibliographic.
AYUSH Research Portal	Indian AYUSH evidence & compendia	System-wise view; CCRAS journals; national context	Coverage depends on feeds; supplement with PubMed/Scopus.
NAMASTE	Standardised morbidity coding; service data	Dual coding (AYUSH + ICD-10/11); national surveillance	Not a literature database; use with study-specific CRFs.

## 6.2 Search strategy essentials

Element	What to do	Example
Boolean	Combine synonyms with OR, concepts with AND	(abhyanga OR massage) AND osteoarthritis
<b>Controlled vocab</b>	Add MeSH (PubMed) / Emtree (Embase)	Osteoarthritis, Knee[mh]
Fields	Focus on title/abstract for precision	ayurveda[tiab]
Filters	Design, language, year cautiously	randomized controlled trial filter
Export	RIS/CSV to EndNote/Zotero/Mendeley	Maintain PRISMA counts

# 7) Putting it all together: a mini-playbook

Research idea: "Does adding a standardised Abhyanga-Svedana package improve function in knee OA?"

- 1. PICO defined; outcomes & time-points set.
- 2. **PubMed search** using MeSH + text words; save strategy and set alerts.
- 3. **Scopus** to broaden and map key journals/teams.
- 4. **CENTRAL** to ensure no RCT is missed.
- 5. **ARP** to capture Indian studies and theses; note formulations used locally.
- 6. NAMASTE codes integrated into data collection plan for any observational component.
- 7. Al assist to tidy records, draft evidence tables, and suggest summary text—you verify every figure.

# 8) Common pitfalls (and fixes)

- One-database myopia: Use at least PubMed + one more (Scopus/CENTRAL) and an AYUSH portal if relevant.
- Weak keywords: Always add controlled vocabulary (MeSH) and synonyms; check mapped terms.
- Predatory sources: Prefer journals with transparent editorial policies; check indexing status (Scopus/DOAJ).
- Unreproducible search: Save your strategies, dates, and filters; report them in appendices.
- Over-trusting AI: Verify every citation; never let AI invent references or conclusions.

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## **Assessment**

## A. Multiple-Choice Questions (MCQs)

### 1. Which statement is most accurate about PubMed?

- A) It contains only full-text articles.
- B) It indexes MEDLINE and other life science records and links to full text where available.
- C) It is a subscription database managed by Elsevier.
- D) It does not support controlled vocabulary.

Answer: B.

### 2. MeSH in PubMed is primarily used to:

- A) Display journal impact factors.
- B) Provide controlled vocabulary for indexing and searching.
- C) Rank articles by citations.
- D) Translate abstracts to local languages.

Answer: B.

### 3. Scopus is especially useful when you need:

- A) Free full texts of all clinical trials.
- B) Citation analytics and wider coverage including books/proceedings.
- C) A registry of RCT protocols.
- D) Controlled vocabulary (MeSH) mapping.

Answer: B.

### 4. CENTRAL (in Cochrane Library) is best described as:

- A) A database of clinical guidelines only.
- B) A curated register of randomised trials compiled from many sources.
- C) A repository of only Ayurveda journals.
- D) A portal for coding morbidities.

Answer: B.

#### 5. NAMASTE portal's distinctive feature is:

- A) Monetising open access articles.
- B) Dual coding using AYUSH morbidity codes and ICD-10/11.
- C) Journal peer review tracking.
- D) Automatic meta-analysis tools.

Answer: B.

# 6. A sensible first step for an Ayurveda clinical dissertation search is:

- A) Only Google.
- B) PubMed with MeSH + AYUSH Research Portal for Indian context.
- C) Social media groups.
- D) Trial registry alone.

Answer: B.

# 7. Which Al practice is unethical or risky?

- A) Using AI to draft keyword lists that you then verify.
- B) Letting AI be listed as an author of your paper.
- C) Using AI to de-duplicate references, followed by human check.
- D) Asking AI to summarise a PDF and then verifying each number.

**Answer:** B. (See Unit 4 publication ethics.)

## 8. An efficient way to avoid missing new PubMed records on your topic is to:

- A) Search once and stop.
- B) Set an email alert for your final search string.
- C) Rely on AI summaries only.
- D) Search titles only.

Answer: B.

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## **B. Short-Answer Questions (SAQs)**

- 1. Write a **PubMed search string** (with at least one MeSH term and two synonyms) for: "Nasya for cervical spondylosis pain."
- 2. List three use-cases for the AYUSH Research Portal in preparing the background section of a dissertation.
- 3. Explain two advantages of using NAMASTE codes in an OPD-based cohort and how they improve generalisability.
- 4. Give two tasks in which AI can assist during a systematic review and one safeguard for each.
- 5. Distinguish in two lines: **Google Scholar** vs **Scopus** for evidence mapping.

## C. Long-Answer Questions (LAQs)

- You are planning a pragmatic RCT of a whole-system Ayurvedic package for knee osteoarthritis across three district hospitals. Describe a search and evidence-synthesis plan that uses PubMed (MeSH), Scopus analytics, CENTRAL, AYUSH Research Portal, and NAMASTE coding to build your background, justify outcomes, and design data collection.
- 2. **Critically discuss the role of AI** in systematic reviews for Ayurveda: benefits, risks (hallucination, bias, privacy), ethical disclosure, and a step-by-step human-in-the-loop workflow that preserves reproducibility.

## D. Practical Task (Hands-on)

Construct and test (in your chosen database) a search strategy for: "Effect of Takra (buttermilk)-based diet on dyspepsia."

- Give the **final Boolean string** for PubMed (include at least one MeSH term).
- List the top 5 additional keywords/synonyms you would use in Scopus.
- Specify how you would record your search (date, database, filters) for the Methods appendix.

# **Take-Home Messages**

- Start with PubMed + MeSH for clinical questions; add Scopus when you need analytics and broader coverage; check CENTRAL for RCT completeness.
- Use AYUSH Research Portal to ground your review in Indian evidence; plan your data capture with NAMASTE +
  ICD dual coding for interoperability.
- Al can accelerate searching and organising evidence, but all outputs must be verified, transparent, and ethically disclosed—Al is a tool, not an author.

End of Unit 7.

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