

# به نام خداوند بخشنده مهربان



# Research Workshop

## Introduction



Davood Khalili, MD, MPH, PhD

Professor of Epidemiology  
Research Institute for Endocrine Sciences  
Shahid Beheshti University of Medical Sciences



## اهداف کلی کارگاه:

- آشنایی با چگونگی نوشتن یک پیشنهاد پژوهشی (پروپوزال) به عنوان نقشه راه
- آشنایی با چگونگی انجام پژوهش
- آشنایی با چگونگی تحلیل نتایج
- آشنایی با چگونگی تفسیر نتایج

**This workshop focus on:**

Epidemiological & Clinical Research

Not Basic Science



Is it search or  
research ?!!!





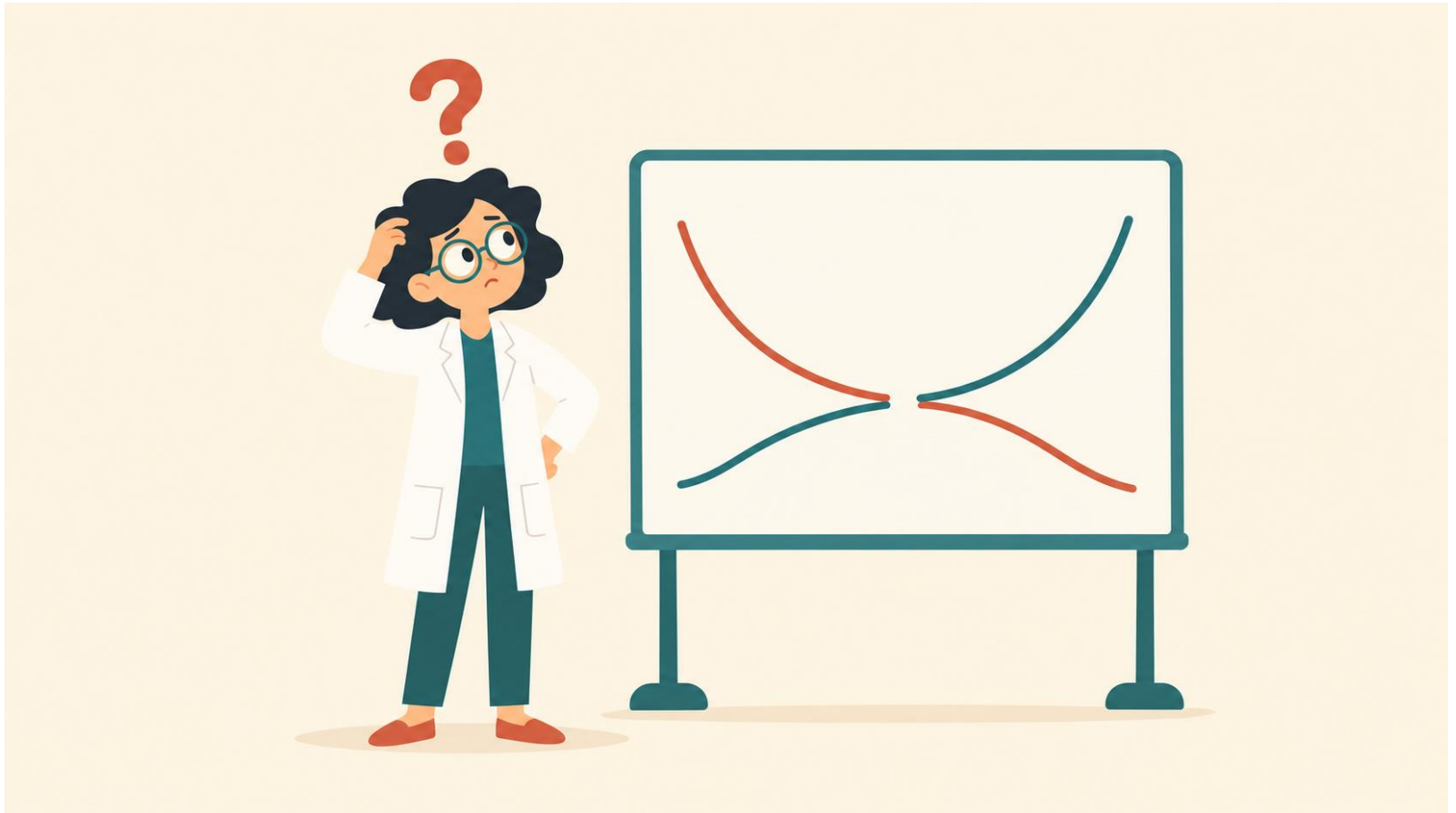
- When you Google "best insulin regimen for a patient with CKD stage 4," are you doing research?
- What would make it research instead of a search?

| Dimension        | Search                                  | Research                                                                             |
|------------------|-----------------------------------------|--------------------------------------------------------------------------------------|
| <b>Purpose</b>   | Find a quick, specific answer           | Generate new knowledge, verify facts, or solve a complex problem                     |
| <b>Process</b>   | Unstructured, unsupervised              | Systematic, step-wise: data gathering, analysis, validation                          |
| <b>Expertise</b> | Anyone can do it                        | Requires methodological training, critical appraisal skills, often supervision       |
| <b>Duration</b>  | Seconds to minutes                      | Months to years, with multiple iterative cycles                                      |
| <b>Tools</b>     | Simple engines (e.g., Google, UpToDate) | Databases (PubMed, Cochrane, registries), validated instruments, statistical methods |
| <b>Outcome</b>   | Fast, surface-level answer              | Deeper, validated insight that contributes to the evidence base                      |

# Research

- Research is “creative and systematic work undertaken to increase the stock of knowledge”.
- RESEARCH is the systematic collection, analysis and interpretation of data to answer a certain question or solve *a problem*.
- پژوهش از فعل پژوهیدن به معنای جستجو کردن است. پژوهش کردن، یک جستجوی هوشمندانه و سامان مند و هدفدار است؛ یعنی مراحل دارد که باید به ترتیب طی شوند تا به نتیجه و هدف برسد. به این مراحل «روش علمی» می‌گویند.

**Why do YOU, as a specialist, need research methodology?**



## WHY IT MATTERS

# Why do YOU, as a specialist, need research methodology?

**1**

### As a Clinician

To correctly interpret and apply the evidence behind every guideline you follow

**2**

### As a Teacher

To supervise trainees, run journal clubs, and judge whether a study is trustworthy

**3**

### As a Researcher

To design, conduct, and publish your own work, and shape future guidelines

*These three roles overlap constantly — the skills learned in one strengthen all three.*

PILLAR 1 OF 3

## In your clinical practice

Guidelines are only as good as the trials behind them. You must judge study design, sample size, endpoints, and stopping rules — not just memorize the recommendation.

### ACCORD Trial

**22%**

relative increase in mortality

Intensive glycemic control targeting HbA1c <6.0% was stopped early — proof that "lower is always better" is not a valid assumption.

### EMPA-REG OUTCOME Trial

**38%**

relative reduction in CV mortality

Empagliflozin significantly reduced cardiovascular death vs. placebo — the basis for SGLT2 inhibitors as first-line in diabetes with CV risk.

*Without methodology literacy, you cannot tell rigorous evidence from marketing, cannot detect industry bias, and cannot individualize a guideline to the patient in front of you.*

Source: [ACCORD \(NEJM, PMC\)](#), [EMPA-REG OUTCOME \(NEJM\)](#)

## In your teaching, as a faculty member

- Advanced trainees rely on you to teach them how to read a paper critically — not just repeat what the abstract says
- e.g. The RACP Advanced Training curriculum in Endocrinology requires trainees to complete a research project with "significant involvement in designing, conducting the research and analysing data"
- As their supervisor, you must be fluent in the same methodology you are assessing
- Journal clubs, case-based discussions, and thesis/project supervision all require you to distinguish a well-designed study from a flawed one, in real time

**Teaching research literacy is now a core, assessed component of specialist training — not an optional extra.**

## In your own research, as faculty/investigator

- Career progression as an academic clinician depends on your ability to generate fundable, publishable research
- Endocrinology and metabolism is data-rich — registries, biobanks, CGM data, national diabetes audits — methodology turns routine clinical data into meaningful research questions
- You cannot contribute to guideline panels, peer review, or grant review without methodological fluency

Bottom line across all three pillars:

**Methodology is not an academic luxury — it is a practical, everyday clinical skill.**



## Research Proposal Writing

# گام های فرآیند تحقیق علمی

- |                                  |                                 |
|----------------------------------|---------------------------------|
| 11. جدول گانت اجرایی             | 1. انتخاب موضوع                 |
| 12. رفرنس نویسی                  | 2. بیان مسئله                   |
| 13. بودجه بندی                   | 3. مروري بر متون                |
| 14. تصویب طرح تحقیقاتی           | 4. اهداف، فرضیات و سؤالات       |
| 15. اجرای طرح و جمع آوری داده ها | 5. تعیین و تعریف متغیرها        |
| 16. نحوه تجزیه و تحلیل داده ها   | 6. تعیین نوع و روش مطالعه       |
| 17. محدودیت ها و مشکلات          | 7. جامعه پژوهش و نمونه گیری     |
| 18. تفسیر نتایج                  | 8. ابزار گردآوری داده ها        |
| 19. ارائه گزارش نهایی طرح        | 9. پایایی و روایی ابزار گردآوری |
| 20. طرح سؤال برای پژوهش های آتی  | 10. ملاحظات اخلاقی              |

# *A Systematic Research*

| Questions you must ask                                                                                         | Steps you will take                                        | Important elements of each step                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What is the problem and why should it be studied?                                                              | Selection, analysis and statement of the research problem  | <ul style="list-style-type: none"> <li>- problem identification</li> <li>- prioritising problems</li> <li>- analysis</li> <li>- justification</li> </ul>                                                                                                                                                    |
| What information is available?                                                                                 | Literature review                                          | <ul style="list-style-type: none"> <li>- literature and other available information</li> </ul>                                                                                                                                                                                                              |
| Why do we want to carry out the research? What do we hope to achieve?                                          | Formulation of research objectives                         | <ul style="list-style-type: none"> <li>- general and specific objectives</li> <li>- hypotheses</li> </ul>                                                                                                                                                                                                   |
| What additional data do we need to meet our research objectives? How are we going to collect this information? | Research methodology                                       | <ul style="list-style-type: none"> <li>- variables</li> <li>- types of study</li> <li>- data collection techniques</li> <li>- sampling</li> <li>- plan for data collection</li> <li>- plan for data processing and analysis</li> <li>- ethical considerations</li> <li>- pre-test or pilot study</li> </ul> |
| Who will do what, and when?                                                                                    | Work plan                                                  | <ul style="list-style-type: none"> <li>- human resources</li> <li>- timetable</li> </ul>                                                                                                                                                                                                                    |
| What resources do we need to carry out the study? What resources do we have?                                   | Budget                                                     | <ul style="list-style-type: none"> <li>- material support and equipment</li> <li>- money</li> </ul>                                                                                                                                                                                                         |
| How will the project be administered? How will utilisation of results be ensured?                              | Plan for project administration and utilisation of results | <ul style="list-style-type: none"> <li>- administration</li> <li>- monitoring</li> <li>- identification of potential users</li> </ul>                                                                                                                                                                       |
| How will we present our proposal to relevant authorities, community and the funding agencies?                  | Proposal summary                                           | <ul style="list-style-type: none"> <li>- briefing sessions and lobbying</li> </ul>                                                                                                                                                                                                                          |

# پیشنهاد پژوهشی، منشور یا پروپوزال چیست؟

- اولین قدم برای شروع یک طرح تحقیقاتی است.
- لیستی از تمام مراحل تحقیق
- گام های پژوهشگر برای انجام پژوهش مشخص می کند.
- پژوهشگر را در رفع نواقص قبل از شروع پژوهش یاری می دهد.
- پژوهشگر را در توجیه هزینه ها و زمان لازم برای اجرای طرح برای سازمان حمایت کننده یاری می دهد.

# TAKE-HOME MESSAGES

- 1 Search gives you an answer; research gives you evidence
- 2 Every guideline, every trainee, and every project depends on the same steps systematic process
- 3 As a specialist, methodology literacy protects your patients from outdated or misapplied evidence
- 4 As a teacher, it is now a formal, assessed part of specialist training
- 5 As a researcher, it is the roadmap that turns a clinical question into new knowledge



enjoy it!

