

RESEARCH METHODOLOGY

From a research idea to a focused, defensible study

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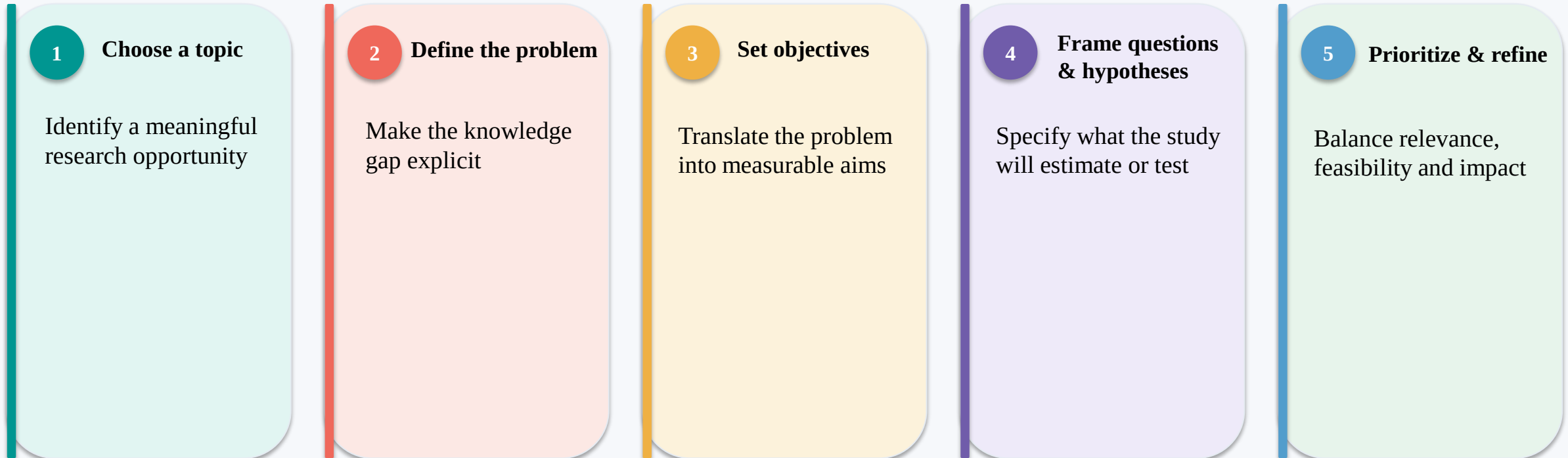
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The research journey

A practical framework for moving from an idea to a coherent study



The quality of the proposal is shaped long before data collection begins.

1. Identify the research question

Good questions emerge from evidence, experience and unresolved problems

1 Experience & expertise

Personal experience / interests
Consultation with experts
Journal clubs

2 Current evidence

Hot-topic articles
Evidence-Based Medicine
Cochrane • systematic reviews • RCTs

3 Guidelines & databases

Clinical guidelines
PubMed
TRIP Database

4 Research gaps

Systematic reviews / meta-analyses
Emerging studies
Theses and new research reports

5 Research priorities

Published priority lists from organizations
Stakeholder-identified priorities

6 Replication & new tools

Geographic / cultural replication
Methodological replication
AI and ChatGPT

A powerful source of questions: the evidence gap

Look for what is unknown, inconsistent, or not yet tested

1

KNOWN

What is already established?

2

UNCERTAIN

Where is evidence inconsistent?

3

MISSING

What has not been studied or verified?

4

ACTIONABLE

What could the study change?

A strong research question is interesting, justified, and answerable.

2. Prioritize the topics

Use a transparent framework before investing in a full protocol

1 Relevance

Alignment with current issues or needs

2 Avoid duplication

Adds new insight rather than repeating established work

3 Urgency

Addresses an immediate trend or crisis

4 Political acceptability

Can gain stakeholder and policymaker support

5 Feasibility

Practical within resources, time and expertise

6 Applicability

Can translate findings into practice

7 Ethical acceptability

Meets ethical standards and protects participants

From criteria to a defensible priority score

Rate each candidate topic consistently

RATING SCALE



Scoring workflow

1. Score every candidate against all seven criteria.
2. Apply the same rules across topics.
3. Calculate the final score and rank topics.
4. Select or refine the highest-priority candidate.

Key principle

Prioritization is not only about scientific interest. It is a structured balance of relevance, urgency, feasibility, applicability, acceptability and ethics.

Relevance Who? How large? How sever?	• 1.Not relevant; 2.Relevant; 3.Very relevant
Avoidance of Duplication	• 1.Sufficient information; 2.Insufficient information; 3.No information
Urgency	• 1.Not urgent; 2.Relatively urgent; 3.Very urgent
Political acceptability	• 1.Not acceptable; 2.Less acceptable; 3.Fully acceptable
Feasibility Manpower, Time, Cost	• 1.Not feasible; 2.Feasible; 3.Very feasible
Applicability	• 1.Not applicable; 2.Less applicable; 3.Very applicable
Ethical acceptability	• 1.Major problems; 2.Minor problems; 3.No ethical problems

	1	2	3	4	5	6	7	
Row	Relevance	Avoidance of duplication	Urgency	Political acceptability	Feasibility	Applicability	Ethical acceptability	Total
1								
2								
3								
4								
5								
6								
7								

3. Write a strong research title

A title should tell the reader what the study is about—quickly

1 Clarity

Main focus without ambiguity.

2 Conciseness

Brief, accurate; ideally 10–15 words.

3 Relevance

Reflect key concepts and variables.

4 Specificity

Show scope and context.

5 Descriptive

Indicate the nature/design when appropriate.

6 Keywords

Use terms that improve discoverability.

7 Avoid jargon

Prefer language accessible to the intended audience.

8 Attractive

Create interest without becoming journalistic.

- **Clarity:** The title should clearly convey the main focus of the research without ambiguity.
 مثال: به جای Examining Some Factors in Metabolic Conditions، می توان از عنوان واضح تری مانند Impact of Insulin Resistance on Type 2 Diabetes Progression استفاده کرد.
- **Conciseness:** It should be brief and to the point, ideally containing no more than 10-15 words (**short, accurate, and concise**).
 مثال: به جای An Investigation and Analysis of Various Effects of Lifestyle Interventions on Metabolic Syndrome Parameters in Adults، می توان گفت: Lifestyle Interventions' Effect on Metabolic Syndrome in Adults.
- **Relevance:** The title should reflect the key concepts and variables of the study, ensuring it is relevant to the research question.
 مثال: اگر پژوهش درباره تأثیر رژیم غذایی بر دیابت است، عنوان باید به رژیم غذایی و دیابت اشاره کند، مانند: Role of Low-Carb Diets in Managing Type 1 Diabetes Mellitus.
- **Specificity:** It should be specific enough to give readers an idea of the scope and context of the research.
 مثال: به جای Study on Endocrine Disorders، عنوان خاص تری مانند Prevalence of Metabolic Syndrome in Obese Adolescents with Prediabetes in Urban Areas مناسب تر است.

- **Descriptive:** The title should describe the main outcome or the nature of the research, indicating whether it is observational, experimental, qualitative, etc.
 • **مثال:** به جای Study on Diabetes، می توان از عنوان توصیفی تری مانند Observational Study on Glycemic Control in Type 2 Diabetes Patients استفاده کرد که نشان دهنده نوع مطالعه (مشاهده ای) و پیامد اصلی (کنترل قند خون) است.
- **Keywords:** Including important keywords can enhance discoverability in databases and search engines.
 • **مثال:** عنوانی مانند Impact of Exercise and Diet on Metabolic Syndrome Outcomes شامل کلمات کلیدی مانند Exercise، Diet و Metabolic Syndrome است که جستجوی پژوهش را آسان تر می کند.
- **Avoidance of Jargon:** Unless the title is aimed at a specialized audience, it should avoid overly technical language or jargon that may not be understood by all readers.
 • **مثال:** به جای Efficacy of SGLT2 Inhibitors on HbA1c in T2DM، از عنوان ساده تری مانند Effect of New Diabetes Drugs on Blood Sugar Control استفاده کنید تا برای غیرمتخصصان نیز قابل فهم باشد.
- **Attractive:** A good title can spark interest and curiosity, encouraging readers to learn more about the research.
 • **مثال:** به جای Analysis of Lifestyle in Diabetes، عنوان جذاب تری مانند Can Lifestyle Changes Reverse Type 2 Diabetes? می تواند توجه بیشتری جلب کند، زیرا سؤالی کنجکاوکننده مطرح می کند.

Title writing: practical rules

Use the title to define the study's scope—not to tell the whole story

1

Avoid journalistic wording

Scientific titles should be informative rather than sensational.

2

Explain abbreviations

Do not assume every reader knows the acronym.

3

Keep it short

The source recommends a short title, with a maximum of about 80 characters.

4

Descriptive studies

Specify WHO, WHERE and WHEN (person, place, time).

5

Use precise terms

For example, distinguish prevalence from incidence.

Title examples: from vague to informative

Small changes can dramatically improve precision

POOR

The Investigating Prevalence of Diabetes

Too vague: population, setting and scope are unclear.

GOOD

The Impact of Diet on Blood Sugar Levels in Type 2 Diabetes Patients

Clearer focus, population and outcome; still improvable.

EXCELLENT

Evaluating the Effects of a Mediterranean Diet on Glycemic Control in Adults with Type 2 Diabetes: A Randomized Controlled Trial

Specific intervention, outcome, population and design.

Vague → focused → specific + descriptive + informative

Candidate research topics

Apply the same prioritization logic to different ideas

1

Plant-based diets

Impact on blood sugar control in patients with type 2 diabetes,

Investigating the

2

Telehealth

Effects on diabetes management in rural communities of Tehran,

Examining the

3

Physical activity

Role in reducing diabetes complications among older adults in Iran,

Assessing the

Next step: score each topic → calculate the total → select or refine the candidate.

4. Build the statement of the problem

Do not jump from topic selection directly to data collection

The statement of the problem is the scientific justification for the study.

1

Magnitude

How large, frequent and widespread is the problem?

2

Causes & evidence

What is known? Consensus, controversy, or inconclusive evidence?

3

Possible solutions

What has been tried or proposed, and with what results?

4

Unanswered questions

What remains unknown, unverified, or untested?

WHY is the study needed? → WHAT will it do?

Statement of the problem: a practical structure

Move from context to rationale, then to purpose

1 Brief introduction

Describe the central issue.

2 Importance

Use relevant numbers and background information.

3 What we know

Summarize established evidence and previous work.

4 What we do not know

Identify uncertainty, contradiction, or missing evidence.

5 Why research is needed

Explain the need for the proposed study.

6 What we will do

State the study objective clearly.

Typical length in the source: about 1,000 words (2–3 pages).

A strong problem statement answers six questions

Use this as a writing checklist

1 How big is the problem?

Check that the answer is explicit in the problem statement.

2 Why does the problem matter?

Check that the answer is explicit in the problem statement.

3 What do we already know?

Check that the answer is explicit in the problem statement.

4 What remains unknown or controversial?

Check that the answer is explicit in the problem statement.

5 What has already been attempted?

Check that the answer is explicit in the problem statement.

6 What will this study add?

Check that the answer is explicit in the problem statement.

5. Translate the problem into objectives

Objectives define what the research should achieve in measurable terms

RESEARCH OBJECTIVE **The purpose of the research expressed in measurable terms.**

1

General objective

The overarching purpose of the study, usually closely aligned with the title.

2

Specific objectives

Logical, measurable components that provide a preliminary view of the study design.

Example: from title to general objective

The general objective preserves the central relationship

TITLE

Investigating the Association Between Sedentary Lifestyle and Metabolic Syndrome in Urban Populations



GENERAL OBJECTIVE

To determine the association between sedentary lifestyle and metabolic syndrome in urban populations

Rule: What exactly will this study determine?

Specific objectives: descriptive + analytic

Specific objectives disaggregate the general objective logically

1 Descriptive objectives

- Determine prevalence of sedentary lifestyle by sex.
- Determine prevalence across age groups.
- Determine prevalence of metabolic syndrome by sex.
- Determine prevalence across age groups.

2 Analytic objectives

- Determine the association between sedentary lifestyle and metabolic syndrome by sex.
- Determine the association across age groups.

Specific objectives should follow logically from the general objective—and anticipate the analysis.

6. Research questions

For descriptive objectives, ask what is being estimated

1

How prevalent is sedentary lifestyle among different sexes in urban populations?

2

How prevalent is sedentary lifestyle across different age groups?

3

How prevalent is metabolic syndrome among different sexes?

4

How prevalent is metabolic syndrome across different age groups?

Descriptive question → estimates a distribution, frequency, or prevalence.

Analytic questions and hypotheses

Analytic objectives should become testable statements

1 Analytic research question

Is there an association between sedentary lifestyle and metabolic syndrome by sex or age group?

2 Why hypotheses matter

For analytic studies, hypotheses make the expected relationship explicit and guide statistical testing.

H_0 Null hypothesis

There is no significant effect or relationship between the variables.

H_1 Alternative hypothesis

There is a significant effect or relationship between the variables.

Testing uses the collected data to evaluate the evidence against H_0 .

Hypotheses: the logic of testing

The hypothesis connects the research question to statistical analysis

1 Research question

What relationship or difference is being investigated?

2 H_0 / H_1

State the null and alternative positions.

3 Statistical test

Use collected data to evaluate the evidence.

4 Conclusion

Reject or do not reject H_0 based on evidence.

Workshop exercise: complete the chain

Turn one candidate idea into a coherent research concept

1 TOPIC

What is the broad area?

2 TITLE

Can it be specific and concise?

3 PROBLEM

What is important, known, unknown and unresolved?

4 OBJECTIVE

What will the study determine?

5 QUESTION

What exactly needs to be answered?

6 HYPOTHESIS

If analytic: what relationship is expected?

Final check: every element should describe the SAME study.

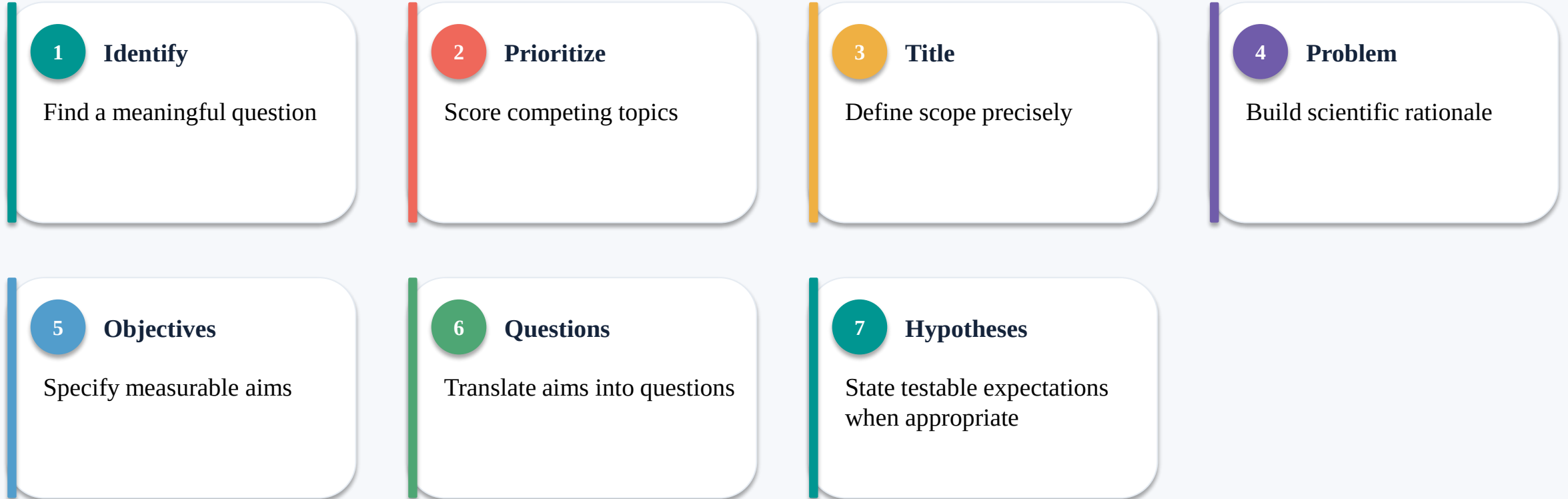
Final checklist before writing the proposal

A compact quality-control screen

✓	Topic	Relevant • non-duplicative • urgent • feasible
✓	Title	Clear • concise • specific • descriptive • searchable
✓	Problem statement	Magnitude • evidence • solutions • gap • rationale
✓	Objectives	Measurable • logically derived • aligned with title
✓	Questions	Directly derived from descriptive objectives
✓	Hypotheses	Present when appropriate for analytic objectives
✓	Alignment	Title ↔ problem ↔ objectives ↔ questions ↔ hypotheses

The complete workflow

A research idea becomes a study through alignment—not accumulation



The strongest proposals are internally coherent from the first question to the final analysis.

FROM IDEA

TO A RESEARCHABLE QUESTION

Choose carefully. Define clearly. Test logically.

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