



# ***Systematic Reviews: Formulating the Research Question***

# ***Formulating the question***

The first step in performing a systematic review is formulating a well-defined research question. A clear, focused and answerable question is crucial to the success of the review.

The focused question provides the operational framework for the systematic review. It helps:

- ❖ Develop the search strategy
- ❖ Give clarity on the scope of the review
- ❖ Identify inclusion and exclusion criteria

The process of formulating the question takes time and may require several revisions before the final question is defined.

# The *PICO* framework

The PICO framework is often used to formulate research questions for systematic reviews.

<b>P</b>	<b>I</b>	<b>C</b>	<b>O</b>
<i>Patient, Population or Problem</i>	<i>Intervention or exposure</i>	<i>Comparison</i>	<i>Outcome(s)</i>
What are the important characteristics of the patient or population (e.g. disease/condition, age, gender, setting)?	What is the main intervention (e.g. drug or other treatment, diagnostic/ screening test)? What is the exposure of interest?	Is there an alternative being considered (e.g. standard therapy, placebo, no treatment)?	What are you trying to accomplish, measure, improve, affect (e.g. reduced mortality, return to function, accurate diagnosis)?

# ***Types of questions***

The type of question you are looking at can change the PICO elements.

Types of questions include:

- ❖ [Therapy](#)
- ❖ [Diagnosis](#)
- ❖ [Prognosis](#)
- ❖ [Harm / etiology](#)

# Therapy question

Therapy: Is one intervention more effective than another?

Patient	Intervention	Comparison	Outcome(s)
Disease or condition, relevant characteristics (age, gender, setting)	Drug therapy, surgery, treatment, lifestyle change, service, social activity?	Another intervention, placebo, standard therapy, no treatment?	Measurable, may be harmful or beneficial (mortality, return to function, cost)
Patient with migraine	Acupuncture	Drug therapy	Reduction in migraine severity

Use the PICO elements to formulate your question:

In **patients with migraine** (P), is **acupuncture** (I) more effective than **drug therapy** (C) in **reducing migraine severity** (O)?

# Diagnosis question

Diagnosis: How accurate is a diagnostic test or procedure?

Patient	Intervention	Comparison	Outcome(s)
Disease or condition, relevant characteristics (age, gender, setting)?	Diagnostic test or procedure	“Gold standard” test or procedure / may not be applicable	Measure of test accuracy, sensitivity, specificity, cost, safety...
Child with suspected appendicitis	MRI scan	N/A	Confirmation of diagnosis

Use the PICO elements to formulate your question:

In **MRI scan** (I), **accurate in confirming diagnosis** (O) of **appendicitis in children** (P)?

# Prognosis question

Prognosis: What is the likely progression, outcome or survival time for a condition?

Patient	Intervention	Comparison	Outcome(s)
Main prognostic factor or clinical problem	Exposure of interest is usually time but may not be applicable	May not be applicable	Measurable, may be harmful or beneficial (mortality, survival, rate of progression)
Adolescent with mild traumatic brain injury	Two years following injury	N/A	Development of psychiatric illness

Use the PICO elements to formulate your question:

What is the likelihood of an **adolescent with mild traumatic brain injury (P)** developing a **psychiatric illness (O)** within **two years following injury (I)**?

# Harm / etiology question

Harm / etiology: What are the causes of a condition or harmful outcomes?

Patient	Exposure	Comparison	Outcome(s)
Risk factors, current health disorders or conditions, setting	Exposure of interest	May not be applicable	Harmful outcomes, progression / incidence of condition
Menopausal women	Hormone replacement therapy	N/A	Breast cancer

Use the PICO elements to formulate your question:

Are **menopausal women** (P) who are undergoing **hormone replacement therapy** (E) at increased risk of **breast cancer** (O)?



# *Types of studies*

The type of question you are answering also affects the types of studies you will search for:

Question type	Type of study
Therapy	Randomise controlled trial
Diagnosis	Controlled trial > Cross-sectional study
Prognosis	Cohort study > Case control study > Case series / case report
Harm / etiology	Randomised controlled trial > Cohort study > Case control study

# *Asking qualitative questions*

Qualitative questions look at people's experiences, beliefs, opinions, attitudes, perceptions etc. PICO is not always suitable for framing these types of questions. The following frameworks can be used to develop questions for qualitative and mixed methods research:

❖ [PICo](#)

❖ [SPICE](#)

❖ [SPIDER](#)

# PICo framework

Population	Interest	Context
What are the characteristics of the patient or population? What is the condition / disease of interest?	The phenomena of interest relates to a defined event, activity, experience or process	The setting or distinct characteristics
Carers providing home-based care to persons with HIV/AIDS	Experiences	Africa

Use the PICO elements to formulate your question:

What are the **experiences** (I) of **carers providing home-based care to patients with HIV/AIDS** (P) in **Africa** (Co)?

# SPICE framework

S	P	I	C	E
Setting (where)	Perspective (whom)	Intervention / Exposure / Interest (what)	Comparison (what else?)	Evaluation (how well or what result?)
Schools	Parents of children with autism	Behavioural therapy	N/A	Coping skills

Use the SPICE elements to formulate your question:

What are the **coping skills** (E) of **parents of children with autism** (P) undergoing **behavioural therapy** (I) in **schools** (S)?

# ***SPIDER framework***

<b>S</b>	<b>PI</b>	<b>D</b>	<b>E</b>	<b>R</b>
Sample	Phenomena of Interest (behaviours, experiences, interventions)	Design	Evaluation	Research type (qualitative, quantitative or mixed method?)
Women	IVF treatment	Questionnaire, survey or interview	Experiences	Qualitative

Use the SPIDER elements to formulate your question:

What are the **experiences** (E) of **women** (S) undergoing **IVF treatment** (PI)?