NIHR | Research Design Service North West

How to develop your research question

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This session

1. What is a **research question** and why do we need one?

2. Choosing and **refining your topic**
   - what issues do you need to consider?

3. Defining the **research question**
   - What issues do you need to consider?

4. Next steps to make progress. How the Research Design Service (RDS) can provide support

1. Purpose of research question

- First step in the research process
  - design and analysis follow
- Focus
  - establish a single primary question to base your design on
- Intention
  - avoid changes that may invalidate conclusions
- Clarity
  - for anybody reading application/protocol

2. Choosing the topic

- A problem that needs to be addressed?
- Inspired by previous research?
- Does current practice work?
- Could we do something better instead?
- Patient/service user involvement?

Points to consider

- Is it important?
- Is it timely?
- Is it original?
- Is it plausible?
- Is it achievable?

Is it important?

- What is the problem - will the research provide an answer?
- Is this an important topic, to who, what are the implications, change in practice?
- Will the results of the research be widely applicable?

Is it timely?

- Does it address issues that are currently of concern?
- Could take several years for results to emerge.
- Will it still be relevant?
- Will technology have moved on?

Is it original?

- Already well studied/ well understood?
- Systematic review/ literature search?
- Little point in duplicating other work? Replication?
- Novelty without triviality
  - intervention for left-handers delivered by 45 year old
- Already in NIHR portfolio?
- Already a trial in progress?

Is it plausible?

- Assumptions about likely effect – based on similar interventions or preliminary research.
- How much of a difference will it make? Enough to matter? Enough to change practice?

Is it achievable?

- Can we conduct a study to address the question?
- Need good design – limit bias, ethical
- Sample size – how many participants?
- Can we recruit that many - evidence?
- Do we know whether it's achievable?
  - if not then consider feasibility study.

What about your own research topic?

- Is it important?
- Is it timely?
- Is it original?
- Is it plausible?
- Is it achievable?

3. Refining the research question

Is it the right research question for the problem the research seeks to address?

Is a vegetarian diet good?

- What is a vegetarian diet?
- What do we mean by good?
- Good for whom?
- Compared to what?

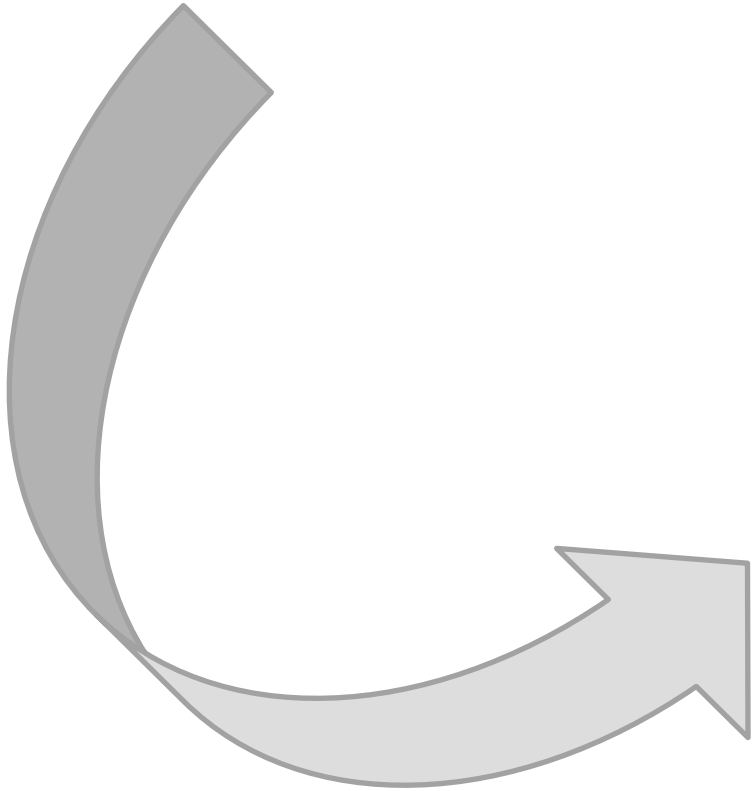
PICO-T

- Population and participants.
- Intervention.
- Comparator.
- Outcomes.
- Timeframe.

PICO-T

- Population and participants
  - healthy people, over 18.
- Intervention
  - a diet that omits meat and seafood, two week diary.
- Comparator
  - Omnivore diet.
- Outcomes
  - prevalence of diabetes.
- Timeframe
  - two year follow up.

Is a vegetarian diet good?



Does eating a vegetarian diet, excluding all meat and fish for at least two weeks, reduce prevalence of diabetes at two year follow up when compared to an omnivore diet in healthy adults?

Aim and Objective

AIM: Overall purpose of the study

- Goals to achieve; Broad; Long-term; General statement; Achievable.

Objective: Steps to reach the Aim or to answer the research questions

- Short-term; SMART: **S**pecific; **M**easureable; **A**chievable; **R**ealistic; **T**ime bound
- Performance-oriented – i.e. a list of tasks
- Setting effective objectives using descriptive verbs

- Synthesise literature...
- Identify practices...
- Recruit sample of participants...

- Conduct in-depth interviews...
- Collect samples from…
- Develop guidelines…

NIHR Definition of a Feasibility Study

…pieces of research done before a main study in order to answer the question “Can this study be done?”. They are used to estimate important parameters that are needed to design the main study.

The design of a feasibility study generally involves listing those parameters which are uncertain and describing the methods for improving their precision so that the main study will have a better chance of success

Feasibility research questions

- How many participants are eligible?
- Are clinicians willing to refer/recruit participants?
- Are participants willing to be randomised?
- Can we collect outcome data?
- What is the mean and variability of outcome measure?
- What is rate of follow up/compliance?
- How long does it take to collect/analyse data?
- Acceptability - what do participants think of the intervention/control/trial procedures?

Feasibility studies

- Likely to require a qualitative component.
- May or may not have a control group.
- Allow for some refinement, different to pilot.
- Should be related to the design of the definitive trial, PICO still crucial.
- May include strict stop/go criteria.
- Aren’t always necessary!

Example

- **Ultimate research question**: Is a Culturally-adapted Family Intervention (CaFI) effective at supporting African-Caribbeans diagnosed with schizophrenia and their families?
- **Need for feasibility study:**
  - Little research on delivering family interventions to African-Caribbean and other ethnic minority groups.
  - Group known to have negative experiences and low engagement with mental health services.
- **Feasibility research questions:**
  - can the intervention be delivered?
  - are eligible participants willing to be recruited?
  - is the intervention acceptable to stakeholders?

For more information see http://research.bmh.manchester.ac.uk/ReACH/research/CaFI/

Qualitative Research questions

- Typically aims to understand or investigate thoughts, perceptions, experiences.
- Usually uses smaller numbers of participants than quantitative research.
- Aims to gain deeper, more nuanced understanding rather than generalisable answers.
- Particularly useful in early phases e.g. refining/developing interventions, understanding potential issues in implementation.
- NOT: counting, measuring, evaluating, comparing.
- Include an expert methodologist in your team.

Examples of uses

- As part of a process evaluation, to understand why an intervention was/was not successful
  - e.g. to understand why health care professionals did/did not deliver an intervention as planned.

- To explore whether an intervention might/might not be acceptable to patient population.

- To understand aspects of a problem from participant's perspective
  - e.g. to inform design of intervention.

Framework for forming Qualitative Research

- **PICo: P**opulation or Problem, **I**nterest, **Co**ntext.

- **SPiDER: S**ample; **P**henomenon of **I**nterest (behaviours, experiences and interventions); **D**esign; **E**valuation; **R**esearch Type (qualitative, quantitative or mixed method).

- **SPICE: S**etting (where); **P**erspective (for whom); **I**ntervention / Exposure / Interest (what); **C**omparison (what else); **E**valuation (how well or what result).

Is a vegetarian diet good?’

- What do people understand by the term ‘vegetarian diet’?
- How do non-vegetarians perceive adopting a vegetarian diet would affect them?
- What barriers & facilitators operate to changing to a vegetarian diet?
- How do non-vegetarians feel about being randomised to a vegetarian diet intervention or to a control group?
- How do vegetarians experience adhering to a vegetarian diet?

Your own question

- What is your question, the overall aim, the objectives of your study?
- Can you write your RQ in the PICO-T framework?
- How can it be improved?
- What methods does this question require to answer?

Remember

Patient involvement can be crucial to shaping the research questions

Your RDS advisor can help with refining your research question, identifying additional expertise for your team.

Any questions?

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