Study Guide 2: How to Write a Protocol

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(1) Overview and learning outcomes

This guide is directed at novice researchers who are in the early stages of planning a research project and need to prepare a protocol. It is relevant to anyone undertaking an MSc course. A check list and example of content is provided. After reading this guide you should be able to:

- Identify the features of a good study
- Describe the key content of a protocol

Associated NHS Fife study guides:

1 How to devise a research question and choose a study design
3 How to critically appraise the literature
4 How to Apply for R&D Management Approval and for a 'Favourable' Opinion from an Ethics Committee
11 How to calculate sample size and statistical power
16 How to achieve success with your dissertation

(2) Introduction

Most research studies in the health service emerge from areas of clinical uncertainty. A preliminary task is to identify an area of interest associated with uncertainty in

clinical practice, to review the general literature on the subject and, possibly, identify a gap in evidence. The next step is to devise the research question and then write the protocol which is an essential component of the research study. The protocol is the 'recipe' you follow to complete the study and to guide any other researcher who may wish to repeat the study. This applies whether the study is qualitative or quantitative in nature. But, before planning the project it is important to be aware of the features of a good study.

(3) Features of a good study

Here is a list of important attributes to consider when planning a research study.

- Descriptive Title
- Clear, focused research question
- Clear aims and objectives
- Realistic milestones
- Acknowledgment of previous literature on the topic (and, possibly, recognition of the gaps in evidence)
- Robust methodology, appropriate study design for the question(s) being asked
- Participants clearly defined and representative of the target population
- Clear selection criteria for participant inclusion / exclusion
- Diagnostic criteria specified and justified
- Any recruitment issues acknowledged and dealt with
- Source of controls specified (if needed)
- Availability of participants – numbers needed and likely to consent
- Power calculation – sample size needed to demonstrate a difference if one truly exists
- Randomisation technique appropriate (if relevant)
- Outcomes specified and relevant to research question
- Reduced potential for bias
- Recognition of the strengths and limitations of the study design

Many of these attributes should be included in the protocol; they will be covered in detail later in the guide.

(4) What is a protocol and why is it needed?

The protocol is a comprehensive, detailed statement of the study with everything you need to know in one place to help you organise the research, including any changes to the methodology that arise during the study for whatever reason. It promotes good discipline and is an essential part in ensuring the research is of a high quality. Anyone should be able to read it and understand exactly what the study is about and be able to duplicate it, if necessary.

Having a good protocol helps when completing grant application forms, ethics forms and forms required to obtain management approval from the Health Board. Much of the detail needed in these forms can be 'cut and pasted' direct from the protocol. In any case, the protocol is part of the document set that is submitted to the ethics committee and to the Research and Development office when seeking NHS management approval. A poor protocol may result in delays in obtaining the necessary approvals.

Finally, it helps with succession planning if you leave and if another person is left to write up the study.

(5) Contents of a good protocol

The protocol should be version controlled with a version number and date in its title. For example, 'WBV Exercise in dialysis Pts (Protocol, version 3, 2015-02-23)'. The chief investigator, the department address and sponsor may be included in the early part.

(5.1) Project title.

The project title should have enough information to inform the reader what the study is about. Ideally, the title should be fully descriptive and include the study design. For example, 'The Utility of Whole Body Vibration Exercise in Haemodialysis Patients: a pilot study'. It may include a short title to be used as a page header, for example, 'Exercise in dialysis patients'.

(5.2) Abstract

The protocol may include a 'stand alone' abstract, usually of no more than 300 words, with one or two sentences covering the background, the aims and objectives, the main methods and outcomes. Abstracts are useful and will almost certainly be requested as part of a grant application.

Example: Lay abstract (296 words)

Physical activity is important to help patients in end-stage renal disease maintain and improve their physical condition and quality of life. However, engaging in physical activity of sufficient intensity and duration can be difficult to achieve and is not without risk of injury. This study will test the efficacy of whole body vibration exercise (WBVE) as a means of enabling dialysis patients to engage in physical activity in a safe environment in the renal unit whist awaiting their dialysis session.

Whole body vibration exercise was developed as part of the space programme to enable astronauts to maintain their fitness and bone strength whilst in earth orbit. With WBVE the patient stands on a platform which is agitated in a sideways and upward movement to deliver a stimulus that the patient's muscles react against. This 'passive' exercise differs from the more conventional 'active' exercise (e.g. walking, cycling, running) and has been associated with improvements in physical functioning in separate research studies. However, we do not know whether WBVE has potential benefits for dialysis patients. The exercise has been shown to be effective even when delivered in short bursts of 3 minutes. We want to test the benefits (if any) for patients undergoing WBVE of 3 minutes for 3 separate occasions each week whilst attending their dialysis sessions in hospital.

We will assess patient's functionality, muscle strength, exercise capacity, nutritional status, bone health, and quality of life before and after an 8 week period of exercise. We will repeat the assessments after a further 4 weeks of not exercising to estimate any residual effects. The study should help us to determine if it would be worthwhile to offer patients with end-stage renal disease this form of exercise to help them improve their physical health and quality of life.

(5.3) Background

The background sets the scene and provides the rationale for starting the study. It mentions briefly what is already known on the subject by referring to relevant literature and identifies gaps in evidence. It may illustrate the importance of the study and its clinical relevance and may specify any personal expertise of the research team in the area, with reference to any past experience of similar or related work.

Example: Background (*)

Patients with end stage renal disease (ESRD) face specific musculoskeletal problems including rapid functional and physical decline after initiation of haemodialysis [1]. Reduced physical capacity results from decline in strength, aerobic capacity [2], muscle wasting [3], along with enforced immobility during treatment. In addition, ESRD causes mineral bone disease (MBD) with abnormal Calcium and Phosphorus metabolism with Vitamin D and Parathyroid disease, along with exaggerated osteoporosis [4]. As a result, ESRD patients rapidly become frail and increasingly dependent.

A recent mini-review identified the evidence that a physical exercise program can improve general health, including a reduction in weight, improved muscle strength, lowered cholesterol and blood fats, increased cardiac output and greater physical exercise capacity in ESRD patients [5]. Many of these benefits will also reduce the risk of heart disease, a risk which is greater for people with kidney disease than among the general population [6]. Furthermore, routine exercise enhances feelings of self-esteem, maintains independence and improves depression and anxiety [7]. Failure of exercise programs results from basic logistics of arranging sessions and equipment around long dialysis sessions and transport times [8]. Despite all this evidence the majority of ESRD patients fail to achieve physical exercise, either aerobic or weight bearing [9].

Previous studies and exercise programs in ESRD have used exercise bicycles during haemodialysis (HD) or gentle exercises during HD (designed to build muscle). Factors contributing to sustainable exercise programs included: dedicated exercise professionals; encouragement to exercise intradialytically; dialysis and medical staff commitment; adequate physical requirements of equipment and space; interesting and stimulating; cost implications. However, compliance with the exercise protocols can be poor [5]. We have been unable to find any previous studies in the dialysis populations that have reported the use of vibration plates.

Vibration exercise is a novel exercise protocol with origins in the Russian Space program, designed to prevent the loss of muscle strength and bone mineralization during the immobility and weightlessness of space flight [10], a situation surprisingly similar to haemodialysis. Vibration exercise uses high frequency vibration of muscle groups causing positive feedback of the spinal reflex arc resulting in high levels of muscle contraction to levels of motor unit recruitment otherwise only achievable by severe weight lifting. Furthermore, this can be achieved with several minutes passively standing on the equipment three times per week. There can be multiple physiological benefits from vibration exercise including cardiovascular effects, bone health and muscle strength [11-16]. Vibration exercise might be an ideal exercise intervention incorporated into the routine haemodialysis units with the potential to dramatically improve strength, bone health, function, and quality of life. However, the evidence of its effectiveness and tolerability in this clinical population remains to be established.

** Note the numbers in square parentheses relate to numbered references*

(5.4) Aims and objectives

The aims relate to the specific goals and the objectives to the specific tasks required in meeting them.

Example: Aims
To provide pilot data on the suitability of the methods, tolerability of the intervention and assessment of the effect of Whole Body Vibration Exercise in ESRD patients to inform the planning of a definitive, multi-centred, randomised controlled trial.

Objectives:
(1) to recruit 40 ESRD patients to the trial,
(2) to review rates of completion and drop out to assess the tolerability of the intervention,
(3) to measure tests of physical function, quality of life and blood components after 8 weeks on the intervention and, again, 4 weeks after stopping the exercise to assess the effects of the intervention.
(4) to undertake a power analysis based on the results to begin planning a definitive randomised controlled trial.

(5.5) Research Question

Where possible the research question(s) should comprise 4 components (PICO)

P: population / patient / participant
I: intervention
C: comparison
O: outcome

Any hypothesis to be tested may be specified here.

Example: Research questions
(1) What is the tolerability of WBVE in patients with end stage renal disease on dialysis?
(2) What are the practical issues in enabling patients to exercise 3 times a week for a 3-minute duration using WBVE?
(3) Which outcome measures are most appropriate to determine the effect of WBVE on functionality, muscle strength, indirect exercise capacity, nutritional status, bone health, and quality of life of patients on dialysis?
(4) What is the magnitude of effect, if any, on each of these measures?
(5) How many patients would be needed (power calculation) to test a hypothesis in an RCT?

(5.6) Methods

The method should include the full plan of investigation. These include:

- Study design
  - Qualitative or quantitative
  - Describe, justify
- Population
  - Sampling frame and sample size
  - How identified

  - Inclusion/exclusion criteria (age, gender, ethnicity, comorbidity)
  - Case definition
  - Matching of controls, randomisation
  - Procedures for invitation and consent of patients
  - Setting: Primary care / Secondary care / Community
- The intervention
  - How delivered and by whom
  - Blinding
  - Methods to reduce bias, contamination etc
  - Risks (and reporting of adverse events)
  - Any pharmacovigilance procedures
  - Criteria, if any, for withdrawing pts from the study
- Outcomes/endpoints
  - Primary (e.g. medication adherence)
  - Secondary (e.g. improved quality of life, reduced relapses)
- Data collection instruments – describe, justify, when and how administered
- Data recording – timing (e.g. glucose tolerance test)
- Data recording – results (e.g. lung function measures – best or average of 3 tests?)
- Include questionnaires as an appendix
- Any quality control measures, for example,
  - Regular calibration checks
  - Validation / cross checking of observations
  - 'Double data entry'

Example: Methods
We wish to test the following methodology:

Patient recruitment
Recruitment will take place at Victoria Hospital Kirkcaldy (VHK), Queen Margaret Hospital, Dunfermline (QMH) and St Andrews Hospital (STA) where patients receive dialysis. We will test our recruitment strategy to determine the likely uptake of the invitation to take part and the dropout rate. We aim to recruit 40 patients with a mix of ages, dialysis vintage and genders, with at least 30 completing the study in the time available.

Inclusion Criteria
All ESRD patients in Fife currently receiving dialysis at the QMH, VHK or STA (approx 150) and deemed fit to participate by their physician (estimated approx 100).

Exclusion Criteria
Consistently hyper/hypotension
Recent cardiac event (in past 6 weeks)
Known aortic aneurysm (of any size)
Unstable angina or significant vascular disease
Current infective illness
Poorly controlled diabetes
Active liver disease
Patients who are breathless at rest with visible signs of peripheral oedema
Bilateral amputees or other physical disability
Patients with pacemakers
Known osteoporosis or history of low trauma, fragility fractures

Persistent hyperkalaemia before dialysis

Procedures

Following recruitment patients will have a training session with the measurement techniques then a baseline assessment (result 1) which will be repeated in 2 weeks (result 2). Thereafter they will receive WBVE 3 times a week, prior to receiving dialysis, for 8 weeks after which the assessments will be repeated (result 3). A further assessment will be made 4 weeks after stopping the exercise to estimate any residual effects (result 4). This design ensures each patient acts as their own control by comparing mean of results 1+2 with result 3 (paired t-test) and, separately, results 3 and 4 (paired t-test). Specifically we will measure:

(1) Sit to stand tests,
(2) Standing equilibrium,
(3) Hand grip strength (dynamometer),
(4) Duke Activity Status Index (DASI) (which correlates with peak oxygen uptake) [17]
(5) Nutrition assessments (skinfold callipers to estimate lean body mass) (4 sites: biceps. triceps, subscapula, suprailiac),
(6) Bone health (ALP, Ca X Pho, PTH, from routinely collected blood measures),
(7) Protein Catabolic Rate (from routinely collected blood measures),
(8) QoL Assessment (using the KDQOL-SF) [18]

The WBVE exercise will comprise 3 sessions of 3 minutes/week, with a graded introduction to achieve 3 min maximum isometric exercise. The 'dose' of exercise is a pragmatic choice and the pilot data will provide evidence of effectiveness to support a grant application for an RCT. The vibration plate will be set at a frequency of 50 Hz and a displacement of 10 mm in line with published levels of effectiveness. The intervention will be delivered by the dialysis nursing staff trained in the technique. Compliance and tolerability of the exercise will be recorded for each patient.

Blood pressure before and after the exercise will be monitored for safety. In addition, bloods are routinely monitored monthly for calcium, phosphate, parathyroid hormone (PTH), alkaline phosphatase (ALP), full blood count (FBC) and protein catabolic rate (PCR) to monitor dialysis adequacy.

At the end of the study, or when patients drop out from it we will interview them to ascertain their views on and experiences of using this type of exercise.

The principal outcome measures relate to physical functioning:

(1) the sit-to-stand-to-sit test (the time in seconds to complete 10 full stands from a sitting position (the STS-10) and the number of repeated manoeuvers that can be achieved in 60 seconds (the STS-60)),
(2) the handgrip strength, and
(3) the DASI

Indicative figures for repeatability and minimal detectable change have been published for the sit-to-stand-sit tests and hand grip strength in dialysis patients [19] but not for the DASI. The results from the present study will be used alongside the available estimates to determine the number of patients required in a study having 90% power (type II error of 0.1) with a type I error of 0.05 (5% significance).

(5.7) Analysis, data storage and security

If a qualitative study specify the theoretical framework (e.g. grounded theory), the data collection methods (document analysis, participant observation, interviews or focus groups), any data validation procedures (e.g. triangulation), the software used for data management (if any), and a justification of the sample size.

If a quantitative study be aware that the type of data to be compared will determine the statistical tests used. Illustrate for each outcome, the type of data and how it will be analysed. Identify any computer databases and the software to be used. Specify the results of any power calculations done to justify the sample size including the assumptions made.

The protocol may include any data coding rules, the storage and security arrangements or any conventions for treating missing data. Specify if an interim analysis is to be conducted and whether a data monitoring committee will be convened.

You may indicate if any formal statistical advice has been sought.

Example: Analysis and data storage
Data will be analysed with SPSS using parametric tests (e.g. paired t-test) and non-parametric tests according to the distribution of the data. Paired t-tests will be used to compare observed differences with a hypothesised mean difference of zero. If the data justifies it we will run a separate analysis of covariance to adjust for initial levels of function and explore differences due to potential confounders such as age, gender, comorbidity (e.g. diabetes), length of time dependent on dialysis and additional leisure time physical activity undertaken.

Data will be stored on NHS password protected computers held on NHS premises.

(5.8) Ethical considerations

These could include:

- Processes for identification of patients and gaining informed consent / assent (may be covered elsewhere).
- Patient information sheet / consent form including where stored.
- Potential risks explained and minimised.
- Patients from vulnerable groups (include poor literacy).
- Reimbursements to patients, if any, to cover their expenses.
- Process for patients to obtain independent advice.
- Any procedures to help patients who may be harmed by taking part (physically or psychologically).
- Role of any user groups (design / monitoring of study).

Example: Ethical considerations
Patients undergoing regular dialysis and who meet the inclusion but do not meet the exclusion criteria will be approached to take part by the Chief Investigator (Dr XXX) or Research Nurse (XXX) as part of the patient's clinical team. They will be given a participant information sheet and given at least 24 hours to decide whether they wish to take part. They will only be enrolled into the study after signing the consent form

which will be kept in the study master file with a copy retained in the patient's medical notes.

We acknowledge that some patients may have difficulty coping with this form of exercise. However, they will be free to withdraw at any time without giving a reason. In addition, there will be oversight by the clinical team which may also withdraw patients they think are likely to suffer adverse consequences from taking part in the study. One of the aims of the study is to determine the tolerability of the exercise intervention.

Regarding risks, some patients may be frail and there is a risk of injury to them whilst exercising. The exercise device is fitted with two handles for patients to grasp whilst standing on the vibration plate. All exercise sessions will be supervised by a renal nurse trained in the procedures. These nurses will monitor blood pressure before and immediately after the exercise session which will be done prior to their dialysis session. However, if patients are considered too frail or too fatigued before their dialysis session the exercise session will be abandoned.

A patient from the unit's user group reviewed the protocol.

(5.9) Research governance

Research Governance issues may be included in other sections of the protocol. Assurances will be needed by the Research and Development (R&D) office regarding:

- Maintenance of confidentiality / anonymisation.
- Security and storage of data.
- Training of personnel (suitability, GCP training).
- Indemnity statement.
- Need for approval from the Medicines and Healthcare products Regulatory Authority (MHRA) for drug trials or devices trials.
- Any Intellectual Property?

However, some of these aspects may not appear in the protocol but be completed in the Research Ethics Committee form and/or R&D form needed for applying for NHS management approval (*see* Study Guide 4: How to Apply for R&D Management Approval and for a 'Favourable' Opinion from an Ethics Committee). Hence, it is important to be aware of and make any necessary arrangements to ensure you comply with these requirements.

(5.10) Timetable

Here you should demonstrate that you have realistically allowed enough time for each component and the project is doable in the chosen time period. Allow time for planning, data collection (including chasing up non-responders), analysis, writing up. Include a milestone chart or a Gantt chart.

Example: Timetable
Week 1 – week 6: Obtain instruments and recruit staff
Week 1 – week 8: Obtain 'favourable opinion' from ethics committee and management approval from R&D office.
Week 6 – week 8: train dialysis staff in safe use of the WBVE devices
Week 8 – week 30: recruit patients (2 per week) (14 weeks in study, so last patient completed week 44)

Week 8 – week 44: data gathering and preparation of database (SPSS)
Week 45 – week 52: analysis of data and preparation of final bursary report and new grant application.

(5.11) Dissemination plan

State how the results will be disseminated to peers and the public. Options include:

- Peer reviewed journals
- Conference presentation (oral, poster, workshop)
- Patient feedback (newsletter, group meeting)
- Seminar to peers
- Report to project sponsor and funder
- End of study form to ethics committee (often overlooked)
- Final report to NHS R&D office that registered and approved the study

Example: Dissemination plan
Results will be published in a peer-reviewed journal. Plans are also in place to present the findings at a National Renal Medicine meeting.

(5.12) Costs

The assessment of costs should include all study aspects including:

- Labour – research, support staff.
- Equipment – purchase, VAT, consumables and any servicing costs.
- Other consumables - postage, stationary, printer ink, photocopying.
- Software purchase / any license payments.
- Costs associated with copyright for use of certain questionnaires.
- Pharmacy and Path Lab costs, if any.
- Miscellaneous - travel expenses (researcher and patient), general practice reimbursement etc.

It is very important to identify and cost in all activity at this early stage to ensure your estimated costs are as accurate as possible. Costs should include time required for staff not actively engaged in the project but who may be required to identify potential recruits to the study. It will be much harder to find additional funding if you discover a shortfall part way through the study.

Example: Costs
<u>Equipment:</u>
(1) 3 WBVE devices – cost £XXX+VAT (=£XXX). The price includes delivery, installation and a training session.
(2) Skin fold callipers – cost £XXX + VAT (=£XXX)
(3) Dynamometer – cost £ XXX + VAT (=£XXX)
<u>Salaries:</u>
(1) For a physiotherapist to undertake the assessments (2 days/week, band 5, for 12 months)
(2) For backfill for XXX who will organise the study and collate data (1 day/week band 5, for 12 months)
<u>Travel:</u>
Estimated as XX trips VHK-St Andrews at 44 miles return and XX trips VHK-QMH at 24 miles return – TOTAL miles = XXXX, current NHS rate is XXp/mile (=£XXXX).
<u>Consumables:</u>

Printing costs £50

(5.13) References

Cite the relevant references.

(6) Summary

The protocol is an essential part of the research study. Once prepared each member of the research team should be given their own copy and be fully familiar with the content. The protocol can contribute to the write up of the study's final report and of any published paper. When writing these reports you do not have to start with a blank sheet!

(7) Further reading

There are many published articles on writing a protocol. A Google search or search on MEDLINE may prove productive if you wish to seek further advice. Also, if undertaking an MSc or Doctoral degree check out any University guidance on the content of the protocol.

Handbook of Health Research Methods: Investigation, Measurement and Analysis. Bowling A, Ebrahim S (Editors), 2005, Open University Press.

Designing Clinical Research, 4th Ed. Hulley SB, Cummings SR, Browner, WS, Grady DG, Newman TB, 2013, Lippincott Williams & Wilkins, Philadelphia.

Appendix: Suggested Headings for a Protocol

Your name and department address, including contact details

Study Title

Background
- reasons for initiating the study
- refer briefly to the literature on previous work
- cite principal references

Aims / Objectives
- State Aims / Objectives
- State the research question
- State the hypothesis to be tested

Method (Plan of Investigation)

Subjects to be studied
- Sampling frame
- Sampling method
- Estimated numbers
- Case definition
- Inclusion criteria
- Exclusion criteria

Method of enquiry
- Type of study (cross-sectional / cohort / case control / RCT / qualitative etc)
- Casenotes study / interview / self-completion questionnaires
- Is a pilot study to be carried out?
- Attach copy of questionnaire as an appendix
- Investigations with detailed methodology – who's to do what and when
- Quality control measures, if any
- Data collection and storage arrangements (data protection issues)

Analysis
- Package to be used
- Data protocol (coding frame, data checking)
- Statistical tests (if appropriate), significance levels adopted

Ethics and Research Governace

Timetable (Gannt chart)

Dissemination strategy

Costs

Glossary

Tip: search Google for an on-line glossary of research terms not included here

Bias	The unequal distribution of error leading to a deviation from the truth
Blinding	The process by which participants and researchers are made unaware of the treatment received in a clinical trial. Blinding can be 'single' when either the participant or researcher is naive or 'double' when both the participant and researcher are naive to the treatment assigned.
Case control	A study that begins with the identification of patients with a disease (or condition) of interest and a suitable control group without the disease. Cases and controls are 'matched' for important features and compared to measure the relative frequency of occurrence of a characteristic believed to be associated with the disease (or condition) in question.
Clinical trial	An experiment that involves the administration of a test regime to evaluate its efficacy and safety to participants who are patients
Cohort study	An observational study in which a group or groups of individuals are followed-up with repeated measures over time to determine the relative frequency of occurrence of a disease or condition. The cohort may be studied prospectively or defined in the past and followed-up to the present day (retrospectively).
Critical appraisal	A systematic method of assessing the strengths and weaknesses of a research study by considering issues of validity, accuracy, bias and clinical relevance.
Cross-over study	A design in which study participants are given all treatments under investigation but in a sequence with a suitable washout period between treatment periods. Each participant then acts as their own control.
Cross-sectional	An observational study to determine the frequency of a particular disease, characteristic or condition measured in a defined population at one point in time.
Document analysis	Systematic analysis of document contents to answer a research question in a qualitative study
Focus group	A qualitative research method in which participants are questioned by a researcher in a small group allowing interaction between members of the group to elicit views.
Grounded theory	A method of analysis of qualitative data in which the researcher identifies issues that emerge from the data to establish theories that can be tested against further emerging evidence as the

	analysis progresses.
Intention to treat analysis	A method of analysis in a randomised controlled trial whereby all participants are followed-up whether or not they actually received or completed the intervention and their outcome measures are analysed in the group to which they were assigned.
Intervention	A treatment, service or policy intended to improve health status or welfare of an individual, family or community.
Non-parametric	Statistical method of data analysis that makes no assumptions about the distribution of the data. The method is appropriate when the distribution of the data is skewed (not bell-shaped).
Parametric methods	Statistical method of data analysis that assumes the distribution of the data is bell-shaped (also called Normal or Gaussian), or approximately so. Examples include the t-test, and Pearson's correlation.
Power	The probability of rejecting the null hypothesis when it is false.
Power calculation	A method of calculating the number of subjects needed for the results of a study to be considered statistically significant.
Qualitative research	A method of studying the meanings people give to their lived experiences, attitudes, expectations and how they make sense of their world. Data may be collected by interview (personal or in a focus group), by participant observation or by reading what they have written. The analysis is non-statistical.
Quantitative research	A method to measure and investigate the relationship between one thing (independent variable) and another (dependent variable). It seeks to quantify relationships between variables. Results can be expressed in simple descriptive terms or as tests of statistical significance between groups.
Randomised controlled trial	A clinical trial to compare one or more treatments with a control condition. Participants are assigned to a group (treatment or control) by random allocation to minimise bias in the study design.
Semi-structured interview	An interview where the researcher has a set of questions to ask but which can be varied in the order given and where the interviewer can depart from the question set to explore emerging themes.
Structured interview	An interview where the researcher has a set of questions to ask each participant but in which the order and wording is fixed.
Triangulation	The use of more than one method, theory, data source in a research study to affirm the study results.

Unstructured interview	An interview where the researcher asks participants very general questions without any predetermined plan to allow the participant to shape the interview in whichever way they prefer.