Study Guide 8: How to Manage a Research Project

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(1) Overview and learning outcomes

This study guide is appropriate to anyone about to start a research project whether they are working alone or with colleagues in a team. It provides some practical advice on successful management of the project through to a successful completion. The guide is best read in association with the other NHS Fife study guides listed below. After reading the guide you should be able to:

- Understand the role of the manager
- Be familiar with the various activities that require consideration
- Be aware of some tools to help manage time
- Be aware of aspects in managing relationships and problems

Associated NHS Fife study guides:

1 How to devise the research question and choose a study design
2 How to write a protocol
7 How to plan your data collection and analysis
16 How to achieve success with your dissertation

(2) Introduction

Planning a research study is one thing, managing it from its implementation through to its conclusion is something else altogether. The two activities are linked for the second leads on from the first. A project may be small, involving a single researcher

(you) or large in scale, involving a multi-disciplinary team. Clearly, the challenge for successful project management will be greater given the second scenario but the principles involved will be the same for both.

Managing a research project is different from managing other aspects of your work. For example, a research project will have a defined time within which to complete it and this can be an important constraint.

(3) The project manager's role

A project manager plans, organises, co-ordinates, controls, leads and motivates the team. The skills needed are:

a) Effective communicator
b) Knowledgeable about the subject being researched
c) Patient
d) Approachable
e) Sympathetic
f) Flexible
g) Persuasive
h) Assertive
i) Decisive
j) Systematic approach
k) Energetic

One of the most important aspects not mentioned in the list is an ability to admit mistakes and learn from them. The manager must be willing to take on board lessons from colleagues concerning what is practical and feasible within the time frame.

The manager must have the time (and energy) needed to do the job effectively; it is not the sort of task that can be fitted into a Friday afternoon. There must be time devoted to the project every day if you are doing it part time. It is ill advised to employ someone to work a few hours a week to manage the project on your behalf. Otherwise you may find yourself doing the job, answering queries when your manager is not around.

So, what is the recipe for success? This involves managing activity, time, the budget, relationships and problems.

(4) Managing activity

In the planning phase you will have decided on the aims and objectives of the work. You should never lose sight of these for they will direct all the subsequent activity. It is important that your fellow researchers (if any) also know the detailed objectives. These will have been written into the protocol and each member of the team must have their own copy of the protocol so they are reminded of their role and specific duties in the overall project. They must be familiar with the protocol which should be well thumbed, and have coffee stains on it!

It can help when planning the various activities to produce a flow chart or 'mind map' (*see* Further reading).

(4.1) Planning Activity

Make up a table of tasks for each activity as well as who is to undertake them and when each task should be completed. Be realistic in setting the timescale to achieve each activity. When planning activity consult the staff who will be undertaking it as they may have a better idea of what is feasible and practical. This helps foster a sense of ownership with the project. A useful working philosophy should be "the staff do not work for me, they work with me".

(4.2) Fieldwork

Project workers must fit into the working day of the organisation they are working in. For example, if engaged in fieldwork in industry researchers must be willing to work during the factory's working day and keep disruption to production schedules to a minimum. Research staff may have to work unsocial hours including night shifts.

(4.3) Managing risk.

You have a responsibility to ensure you and any staff working with you are not put at risk during the research work. This includes the risk to personnel working alone or off site, for example, during home visits when they may face unsavoury surroundings, uncontrolled dogs, secondary smoke etc. A risk assessment should also be carried out for the study participants as your responsibility extends to them as well.

(4.4) Collecting data

Managing activity includes the collection of data that might be from hospital records, surgery records, or from interviews and physical examination of patients. All records from whatever source must be treated as confidential. This requirement must be emphasised with any temporary staff engaged to collect data. Breach of confidentiality is a disciplinary matter.

Be wary of relying on others to help out with the project, for example, using personnel staff to distribute appointments in a factory, or receptionists or records staff to find medical records for you. These individuals are unlikely to share your enthusiasm for the project and may not have the time to devote to the work if expected to fit it in with their usual daily tasks. Your priorities may not be theirs.

Particular difficulties may be encountered in managing follow-up studies with multiple repeats. Access can be a problem for some participants, for example those working shifts, or off shore and there may be a need to arrange repeat appointments out of hours for those unavailable when you are. For many of us research has never been and never will be a '9-5 occupation'!

(4.5) Data collection protocol

For all sources of data you will need a data collection protocol with data definitions (e.g. how long should a smoker have given up before you classify him/her as an ex-smoker). Also, record all details of the coding frame being used (1=male, 2=female, H=home, HP=hospital) including codes for recording missing data (a blank is not acceptable).

(4.6) Protocol violations

Advice is needed on the procedure to be followed when there is inconsistency between two data sources on a specific variable. For example, which record is to be accepted when there is a difference in the reported date of birth? Any procedures should be recorded in the study protocol or an SOP (Standard Operating Procedure) for staff to follow.

(4.7) Quality control

An important aspect is the quality of measurements. Each instrument used to make measurements should have regular calibration checks with all calibrations being recorded in a book kept for the purpose. Do not rely on simply calibrating an instrument at the start and end of a study; periodic checks, monthly, weekly, or daily are necessary to ensure confidence in the measurements being made. Regular checks will also allow you to identify measurement errors and intervene early to correct them.

Check the quality of data being generated at regular intervals. This is particularly important if you have different sets of equipment being used by different observers. Make sure the necessary calibration checks are being done by the observers and that the calibration records are being kept up to date.

If you are employing two or more observers they will need to be trained together initially to ensure they are making comparable observations. Also, avoid potential bias whereby, for example, one observer sees all the men and another sees all the women. If you have multiple observers interviewing study participants ask them to record the time taken in completing the interview and examination. Watch out for staff taking short cuts which can occur when they become familiar with the measurements. Some practical examples of issues and checks are given in the NHS Fife study guide ‘How to plan your data collection and analysis’.

(4.8) Managing information gathered

Process the data at regular intervals and upload it into the analysis package as it is gathered. This helps to identify any slippage on the quality and completeness of the data. Pay attention to data security which is critically important. Data should be kept on password protected computers with access restricted to only those with a legitimate reason. Data should only ever be kept under the terms of the Data Protection Act (1998), or other relevant legislation, and of any local information governance requirements.

(4.9) Communication

Successful project management is more likely if you limit the number of people you have to depend on for its success! In one primary care study serious problems were encountered by relying on busy receptionists who were tasked with passing on faxes to the GP. The faxes were received and filed in an in-tray but not passed on according to the schedule. In consequence, important delays were experienced. Build in checks so you know when a communication is received. Do not assume because you have sent an email, fax or letter that the intended recipient has actually received it and is ready to action it.

In another study patients with cancer were being recruited by ward-based nursing staff but they were not enthused by the project and, though sufficient numbers of patients were available insufficient numbers were recruited in the time frame. An additional problem, not recognised at the planning stage, was the turnover of ward staff which threatened the continuity of the recruitment process. In these circumstances you should keep regular contact with the staff to motivate them and maintain their interest in your project.

(5) Managing Time

Use appropriate tools to monitor timescales. These can include a GANNT chart (Figure 1), time logs, diaries, or a table of project milestones (Table 1). Be realistic in your expectations and build in respite periods to catch up and to allow for annual leave, public holidays, school holidays etc. GANTT charts and Milestone charts can be used to plan ahead and monitor progress against set objectives.

When planning the recruitment phase be aware of our ability to overestimate the response of our patients and service users. They do not always share our enthusiasm for the work. A special problem with recruitment is the law of diminishing returns whereby, in some projects, initial success in recruitment may not be maintained in the later months because potential recruits may have already been approached and declined to participate.

Figure 1. An example of a GANTT chart for a 12 month project (starting in July 2015). This chart includes a 6-month run in to develop the project and obtain the necessary permissions (NHS ethics and management approval).

Activity	Months																	
	-6	-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12
Develop proposal																		
Literature review																		
Write Pt info sheet																		
Ethics application																		
R&D approval																		
Project meetings																		
Annual leave (06/15)																		
Recruit patients (07/15)																		
Collect data																		
Analyse data																		
Prepare draft report																		
Prepare paper(s)																		

Table 1. The equivalent milestone chart from the example in Figure 1.

Date chart revised / completed	/ /			
Milestone	Schedule (weeks)	Month ended (from January)	Actual (weeks)	Achieved (✓) with date
Develop proposal	-12	March 2015		
Literature review	Ongoing	June 2016		
University approval	8	April 2015		
Write Pt info sheet	8	April 2015		
Ethics application	8	June 2015		
R&D approval	8	June 2015		
Project meetings	-	03/15, and bimonthly		
Recruit patients	20	November 2015		
Collect data	28	January 2016		
Analyse data	28	March 2016		
Annual leave	3	June 2015		
Prepare draft report	24	April 2016		
Prepare papers	8	June 2016		

(6) Managing the budget

This is a specialised task and, to help, there are budget control charts and accounting software available. However, in NHS Fife a finance officer is employed in the Research and Development office to manage budgets on research projects. In general, together with the finance officer you should keep note of projected costs, actual costs, the balance and variance from that expected. It is important to keep copy invoices so you can keep track of what has been paid out.

Make sure you budget for *all* the costs including apparently minor items such as postage, paper, and printer ink as the NHS should not be expected to pick up these incidental costs.

Overspend occurs when there has been an increase in unit costs (perhaps from a change of provider or use of an old schedule of charges). A common problem is failure to allow for VAT that is sometimes overlooked in estimating the project's budget. Other oversights can be unexpected downtime for equipment and breakdown and routine service costs.

When costs do exceed the budget you may be able to move monies around from one pot to another (called *virement*). However, this is not always allowed by a funder so make sure you are familiar with the terms and conditions of the grant award.

Particular problems can arise with travel costs. Maintain control and do not allow staff to build up mileage expenses and then hit you with a huge (but justified) bill later. Be careful if you are offering to cover patient costs and clearly specify any limit to these in the patient information leaflet.

(7) Managing relationships

These can include:

a) yourself,
b) your employed research staff,
c) other practice staff (receptionists),
d) hospital record clerks,

e) any volunteers working on the project,
f) study participants,
g) external agents (e.g. equipment suppliers, service engineers, hospital-based nursing staff, other pharmacists/dentists),
h) colleagues who may be affected directly or indirectly by your research activities.

Effective oral and written communications are essential in managing relationships. An early principle is to retain as much control as possible over as many aspects of the study as possible. There are many threats to a successful conclusion and projects often fail or are delayed because their completion depends on someone else not intimately connected with the work. Hold regular team meetings with a typical agenda:

a) review of progress / timetable
b) identification of problems / the solutions used
c) set objectives of next activity step
d) review of personnel activities of next step
e) any other issues?

The role of the manager in these meetings is to recognise problems and find solutions, to motivate staff and keep them informed of progress.

It is paramount to keep **written records** of the minutes of the meetings with action points recorded where needed and decisions made. The minutes should be circulated shortly after the meeting so all can agree with what was recorded. This ensures the team's activities are co-ordinated. Even if you are working single-handedly keep written records of your activities and decisions made so you can always check back.

(8) Managing problems and making decisions

Do not leave problems to fester. Deal with them as they arise. If appropriate, discuss the problem with others in the research team and work through the various solutions and consequences of each for the study objectives, the timetable and the budget. When you make a decision, stick to it.

(9) Summary and recipe for success

Effective management of the project is integral to achieving a successful outcome for the study. The advice given here should help you achieve this but other sources of advice are available (*see* Further reading). In summary, consider this recipe for success:

- Retain control!
- Do not throw away anything. Keep all records.
- Hold regular project meetings and maintain written notes of them.
- Circulate any minutes and notes of decisions taken shortly after the meeting so all can agree or disagree with what was discussed.
- Keep written notes of any oral communications.
- Keep a project diary.
- Involve staff with decision making where possible.
- Motivate staff constantly.

- Acknowledge their contribution.
- Keep them informed of progress towards objectives.
- Learn from the mistakes. Never be afraid to admit when you are lost.
- Ensure staff can always approach you if they have a problem. It helps staff to do the work if they know the rationale behind the tasks, rather than 'I do this because my manager tells me to do it'.
- Check the quality of data as it is recorded. Do not wait until the end of the data collection exercise.
- Avoid biases in data collection through training of observers and ensuring individual observers do not see different subsets of patients.
- Where possible always make measurements concurrently in intervention and control subjects.
- Maintain the database and update it regularly. Do not finish data collection then set up the database.
- Keep a diary of the analyses with notes on decisions made and the next step when you complete a session.
- Decide early on who is to write up the various sections of the report / paper.

Remember the 5 'P' principle: Perfect Planning Prevents Poor Performance

It is unlikely that you will be able to plan for all eventualities. So, remember also the statistician's approach:

if there's a 50:50 chance of something going wrong then 9 times out of 10 it will!

(10) Further reading

The Mind Map Book. Tony Buzan. BBC books, 2009.

Introduction to project management in health research: a guide for new researchers. Tim Usherwood. Open University Press, 1996

Mind mapping for the project manager. Tim Walker, 2014.
http://quickbase.intuit.com/blog/2014/06/16/mind-mapping-for-the-project-manager/