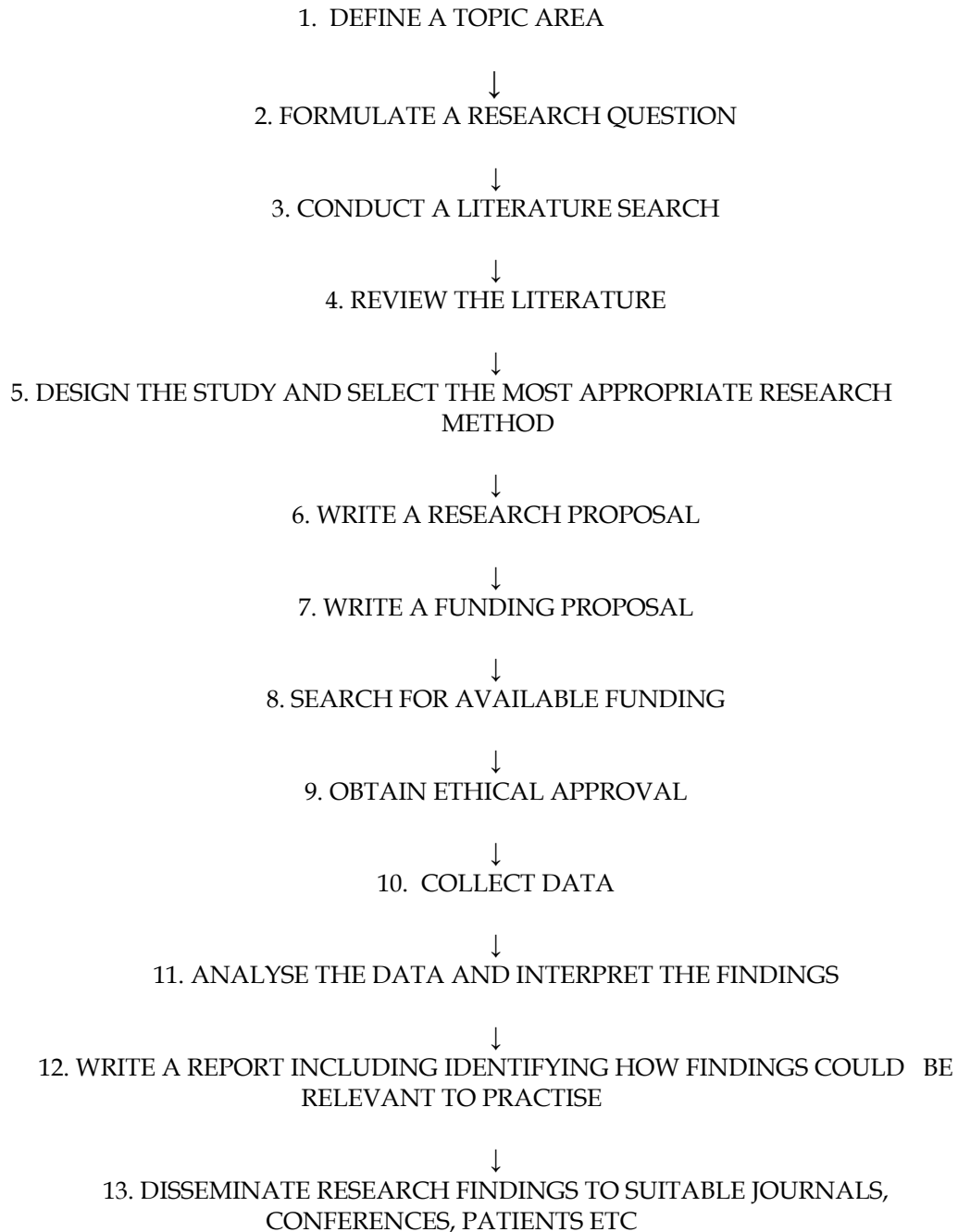


The Research Process

The idea of beginning a research project can be daunting for a novice researcher. There are a number of stages that need to be addressed in order to produce research that is both ethical and of high quality. The stages involved in the research process can be summarised:-



Each of the steps will be briefly covered in turn.

Step 1. Define a topic area.

Osteopathy is based on the ethos of treating the patient rather than discrete diseases. The patients who consult osteopaths can arrive with a number of disorders and this can give rise to a wide variety of special interests for osteopaths which can lead to research questions. Research questions can also arise for other osteopaths who find they simply want to know more about a specific area of practice. Focussing on a specific topic area is a more productive approach.

Step 2. Formulate a research question.

This can be achieved most easily by using the PICO(T) formula that was discussed in Tutorial number 1 in November, 2004. The most important part of any search is to have a clear question formulated, either mentally or in written form; without this a significant amount of time can be spent simply going around in circles. Four key components of a question must be considered when looking for information relevant to practice. The question guides the search:

P Population or Patient: Who are the patients about whom you need further information?

I Intervention or Indicator: What is the osteopathic treatment plan, allopathic management, diagnostic test, pharmaceutical management, surgical procedure or dietary change you are interested in?

C Comparator or Control: What is the alternative treatment strategy, technique or other procedure that you will be comparing your intervention to?

O Outcome: What effect will the intervention being considered have on the patient?

T Time: What is the timescale (if any) involved in the project?

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Example:

Question: “Do patients with osteoarthritis of the knee joint(s) find osteopathy or non-steroidal anti-inflammatory medication most beneficial for pain relief?”

Patient/population: Patients with osteoarthritis OR arthrosis in the knee joints.

Intervention/indicator: Osteopathy OR osteopathic treatment (Using osteopath* will cover both terms).

Comparator/control: Non-steroidal anti-inflammatory medication OR NSAIDs OR medication.

Outcome: Pain relief.

In Evidence Based Practice (EBP) research questions can include a variety of examples: interventions, aetiology and risk factors, frequency, diagnosis, prognosis and prediction. In each case the PICO method can be used to formulate a suitable question. It is important to identify keywords that relate to the research question; one of the easiest methods is to tabulate them so that searching can be done in an organised and time efficient manner.

Step 3. Conduct a literature search.

When conducting a search for literature it can be surprising just how many research studies have been carried out. It is important, therefore to use very clear keyword and truncation terms. Truncation is described in Evidence Based Practice Tutorial number 3 and can be found at www.ncor.org.uk. The use of BOOLEAN operators to narrow or widen a search has been described in Evidence Based Practice Tutorial number 1 and can be found at www.ncor.org.uk. All of the information in these tutorials has also been published in earlier editions of The Osteopath starting in November, 2004. Literature can be found at a number of locations; PubMed (www.ncbi.nlm.nih.gov) remains the largest free to access database. The osteopathic education institutions have libraries containing old copies of various journals. New ventures such as the “osteoselect” website (www.osteoselect.com) give access to various databases and other resources for the payment of a modest membership fee. The Research Council for Complementary Medicine (www.rccm.org.uk) also conducts literature searches for the payment of a fee.

Step 4. Review the literature.

When literature has been located, it is important to attempt to appraise the articles since the quality of information found on the internet can be variable. A variety of critical appraisal tools are freely available. A wide selection covering many study designs can be found at www.phru.nhs.uk/casp/learning_resources.htm. Critical appraisal of the literature has also been covered in the previous three editions of The Osteopath and can be found at www.ncor.org.uk. Reviewing the literature can be quite daunting initially and it can be helpful to have checklists to follow to try and identify the criteria that should be covered in good quality research papers. It is a process that becomes easier with practice.

Reviewing the literature is an essential stage of the research process as it helps a researcher to discover if their area of interest or research question has already been investigated. Research should aim to answer novel research questions and thereby fill gaps in the literature currently available.

Step 5. Design the study and select the most appropriate research method.

A variety of research designs exist and it is important to be quite clear about the aim of the research project in order to select the most appropriate design. If two interventions are being tested the randomised control design can be the most suitable. If survey information is required, a number of survey methods exist e.g. questionnaires and interviews. Further information on this type of research can be found at www.socialresearchmethods.net/kb/survey.htm.

Consideration of other research designs can be found in the December 2005/January 2006 edition of The Osteopath.

Suitable sample sizes must be present in research studies in order to give the study adequate power. Advice on sample sizes and sampling can be found on a variety of

websites e.g. www.sgul.ac.uk/depts/phs/guide/guide.htm and www.sportsci.org/resource/stats.

Step 6. Write a research proposal.

Writing a research proposal, although daunting, can be a helpful exercise to concentrate the focus of a research idea into the practicalities of conducting a research study. A research proposal will vary from study to study but some common features should exist:

- A title should be present which should clearly express the research question.
- An abstract or summary should briefly outline the aim of the study, how it will be conducted and what it is intended to achieve.
- A rationale for the project should attempt to place the study in context; the research should be attempting to address an area that hasn't already been investigated.
- The aim or objective of the study should be clearly defined. This should stress the importance of the study and its contribution to the body of knowledge.
- The method for the study should be clearly described and give an indication of numbers of patients involved, inclusion and exclusion criteria, recruitment methods, data collection methods and frequency, analysis of data and the proposed dissemination of research findings.
- Ethical considerations will be described in the method and should clearly describe the type of ethical opinion to be sought e.g. NHS Research Ethics Committee (REC) or REC within an educational establishment. For all research involving human participants, an ethical opinion must be sought.
- The benefits of the study to a profession/scientific community and patients should also be clearly described.
- Resources and costs should be disclosed. The sources of any funding or proposed funding should be disclosed. A clear consideration of the costs for the study should be disclosed to ensure that sufficient funding is available to complete the study. It is highly unethical to begin a research study and run out of money to complete it.
- Details of peer review should be disclosed. The peer review process can offer suggestions on the suitability of methodology, suggestions regarding patient groups and the type of data to be collected. For novice researchers this stage is invaluable as a source of guidance to avoid pitfalls that are costly in terms of time and resources.

Osteopaths working in the NHS would need to discuss their proposed project with their manager and it would also have to be submitted for approval by the appropriate research and development (R&D) department.

Step 7. Write a funding proposal

Location of funding is frequently difficult. Funding available for osteopathic research can be especially hard to locate particularly if a researcher has no established "track record" of previous funding awards. Writing a funding proposal is a task that can be aided significantly by enlisting the assistance of an experienced researcher.

Step 8. Search for available funding

Osteopathy, in combination with complementary therapies does not enjoy access to significant sources of funding. Some of the larger health insurers e.g. BUPA

establish research priorities each year and proposals are invited. Charitable organisations e.g. BackCare also put out calls for research proposals throughout the year. The position for single handed practitioners wishing to conduct research does, however, remain very challenging.

Step 9. Obtain ethical approval.

The need to obtain ethical approval for a study will depend on whether a study can be defined as research or audit. Audit does not usually require ethical approval; research does. Practitioners working within the NHS or working with patients in private practice who have been directly referred by the NHS need to gain approval through an NHS Research Ethics Committee (REC). Osteopaths working in private practice can seek approval through such committees but this can take significant periods of time. Many RECs are already very busy and some have very little experience of osteopathy which can add to delays as they require further clarification of terms. Evidence of insurance cover, a patient information sheet, a patient invitation letter and a copy of the consent form must also be provided with the submission form to an ethics committee. The length of time to obtain this type of approval must be factored in to any research study.

Osteopathic education institutions have their own ethics arrangements; other HEIs also have their own REC arrangements to give approval to student projects at all levels of education e.g. undergraduate, masters and doctoral level.

Further information about RECs can be found at the Central Office for Research Ethics Committees (COREC) via www.corec.org.uk.

Step 10. Collect Data

The type of data to be collected and the manner in which it will be collected should be clearly described in the research protocol. This should give information about the type of instrument used to collect data e.g. a questionnaire or some form of measuring equipment e.g. a goniometer. The number of patients from whom data will be collected, how frequently and with what time intervals should be described. Statistical advice should be sought before data collection begins to ensure that the right type and quantity of data will be collected to be able to answer the research question. A research study that lacks significant numbers of participants to have any statistical power may not gain ethical approval. Awareness of bias in the researcher(s) and the research subjects should also be considered.

The Data Protection Act, 1998 clearly stipulates criteria for the appropriate use of patient data; this includes issues of confidentiality and the need to anonymise patients' data using codes. Further information on the Data Protection Act can be found at the Information Commissioner's website www.informationcommissioner.gov.uk.

Step 11. Analyse the data and interpret the findings.

A wide variety of statistical programmes are available for analysis of research data. The type of programme used will be largely defined by the type of research methodology used e.g. qualitative or quantitative. Suitable coding can be carried out on both types of data and this can be entered into a computer programme. Quantitative analysis can be carried out by programmes e.g. excel or SPSS. Qualitative data can utilise programmes e.g. NVIVO. Many researchers analysing qualitative data prefer to use simpler methods e.g. examining themes and

categories that are recurring throughout the responses given during interviews with research subjects or by examining their written (free text) responses to questions.

Step 12. Write a report including how findings could be relevant to practise.

Many researchers prefer to write up their results in a formal manner with a view to how their research findings will be disseminated. All health care professions are identifying a greater need for evidence to inform their practise. The reporting of research findings through being formally written up and disseminated contributes to that evidence base.

Step 13. Disseminate research findings.

This can occur through a number of different means. Publication remains the most effective manner to disseminate findings as it is likely to reach the largest audience. An increasing number of journals exist and welcome publications, particularly if primary research is involved. All journals have guidelines on their styles and the word limits they allow for published material. Increasing numbers of osteopaths are now studying at MSc and PhD levels; more publications emanating from dissertations would make a valuable contribution to the evidence base for osteopathy. The newly created International Journal of Osteopathic Medicine (IJOM) describes its requirements at <http://authors.elsevier.com/JournalDetail.html?PubID=705245&Precis=DESC>.

Conferences can also be a valuable opportunity to present research findings. Many research conferences occur each year and call for abstracts to be presented orally or as posters.

Informing research subjects is often forgotten in research dissemination. Some patients who have participated in a research study may choose to record their choice to be kept informed about research findings. If research has taken place within an osteopathic practice where research has taken place it can be helpful to produce a newsletter or short report, written in layman's terms, for patients to read about the findings of a study.

Further helpful information about the research process can be found at www.rdfunding.org.uk/flowchart/Flowchart.html.

Are you're thinking about conducting some research?

If you have a particular area of interest, would like to carry out some research and would like some help to get started, please call the NCOR office on 01273 643457 or email c.a.fawkes@brighton.ac.uk.