Learning to read research papers

Here **Sarah Bryan** and **Diana Newson** take you step-by-step through the standard format of published research papers and explain how understanding research evidence can help inform your future practice


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Research is not just for 'clever' people who have spent years with their heads in books. In fact, most of us conduct some sort of research in our clinical practice all the time, without realising it.

When you notice that a specific essential oil is always effective for Mr Smith's lower backache, or that Mrs Brown tells you that she always sleeps better after her treatments, you are conducting research. The only things missing are having the confidence to write it down and investigating how your own observations fit in with those of other practitioners.

Process of enquiry

Once we start writing down our observations, we may spot repeating patterns of treatment methods and results. This may then lead us to ask whether our colleagues have noticed the same things happening with their clients or whether any formal studies have been carried out.

If we cannot find any relevant research, or if there are only one or two papers on the subject, our clinical practice can help us to define areas for further investigation. This process of enquiry is how our clinical work can lead to practice-based evidence, which can be developed and formalised.

Equally, the evidence that we gather from our own practice and from reading research articles can then be used to *inform* our future clinical practice, as we fathom out what actually does and does not work when treating clients with specific conditions.

The concept of evidence-based practice has underpinned mainstream health professions for some years now, giving mainstream medicine the reputation of being highly scientific. The lack of such research in the field of holistic medicine is the main reason why holistic therapies and those who practise them have not gained the same credibility.

If holistic therapists wish to play a greater role in integrated healthcare and to receive more recognition from doctors and other health professionals, we need to adopt this more scientific approach to our work: using our practice to guide research and research evidence to inform our practice.

This article aims to introduce you to the standard format of published research papers, so that you can start to read them, familiarise yourself with their style, and write up your own work.

Format of papers

Research articles generally follow a standard format, which can seem daunting at first. However, each section is an important part of the story that emerges as you read. At the very top of the first page, you will see the title of the article, the authors' names, the date of publication, the journal title, volume, issue and page numbers. This is the information you need in order to cite someone's work in your own writing, so it is well worth noting down. ➤

Abstract

This is a brief summary of the article which tells you the aims of the study, methods used, results and conclusions in a nutshell. This is especially useful when you first start researching an area and you are unsure which papers to focus on. It is easy to become overwhelmed by masses of articles on a subject and not know where to begin. Reading the abstract can help you keep hold of the relevant articles and ditch the rest.

Introduction

The full research paper opens with an introduction which covers background research for the current study. The authors discuss the pros and cons of previous studies, the differences between them and formulate their own research questions based on this information. When you have read the introduction, the scene has been set for the current paper and you should have an idea of the questions the work is trying to answer.

Materials and methods

This is written in the past tense since the researchers are talking about what they did. It can be seen as the 'instruction manual' for the study. When you read the method section, you should be able to identify who took part in the study (participants), what equipment and products were used (materials) and how the research was done (procedures).

If the method section has been clearly written, you should be able to replicate the study if you choose, or perhaps to tweak it. The participants involved will depend on what type of study it is. A case study involves just one participant, while other studies involve one or more groups of participants.

The method section also introduces you to the variables being analysed in the study. Broadly speaking, there are three types of variables: independent, dependent and confounding.

The *independent variable* is the factor that is being manipulated. Examples for aromatherapy would be:

- Comparing those who received aromatherapy with those who did not, in order to examine the effects of aromatherapy
- Comparing those who have a specific health condition with healthy participants, in order to examine the effects of that condition
- Collecting data from the same participants both before and after aromatherapy treatment, in order to investigate the effects of aromatherapy

When you have two or more participant groups, the more 'interesting' participants in the study are known as the experimental group, whereas the 'boring' ones, or the poor souls who drew the short straw and did not receive aromatherapy, are known as the control group.

The *dependent variable* is what is being measured - for example, the effect of aromatherapy on aches and pains, mood or sleep patterns. The idea is that only the independent variable should be manipulated and everything else should remain constant.

However, *confounding variables* (or confounds) can sometimes creep in. This happens when the researchers unwittingly overlook or introduce something into their study which could bias the results. A confound could involve the participants, materials or procedures and may be either blatant or subtle.

For a study of aromatherapy and sleep, an example would be to suddenly discover that some of the participants were taking sleeping tablets. This would make it impossible to know whether the results were down to the oils or the drugs. Ideally, no participants in such a study would be taking any tranquillisers or medication that causes drowsiness. It's unlikely that such a blatant confound would come up in a published article, but it is always worth examining the methods used and making a note of anything which does not seem quite right, or which you think should be done differently.

Results

This is the 'meat' of the article and tells you what the researchers found. Findings may be quantitative (numerical), qualitative (descriptive) or both. Sometimes, the results can be shown in neat paragraphs, tables or graphs, so that the findings are obvious to the reader.

> "For therapists to play a greater role in integrated healthcare we need to adopt a more scientific approach to our work"

However, quantitative studies often also involve statistical tests, which generate lots of obscure numbers. These tests have long names and the test chosen depends on the type of study and data collected. You need not worry about this too much unless you are carrying out your own quantitative study.

The important number to be aware of is the probability value (or p value). p is the likelihood of the observed results occurring by chance. If it all happened by chance, the value of p is 1. As the probability of the observations happening by chance gets smaller, so p will also get smaller. In statistics, p needs to be 0.05 or less, in order to be 'significant' for the study, indicating that the findings were a direct result of the variable under investigation, for example, a specific aromatherapy treatment. A value greater than 0.05 is non-significant and suggests that the findings may be due only to chance.

Conclusion, discussion or evaluation

This is where the authors discuss their findings, tying them in with previous research and drawing conclusions. They

point out any confounds which came to their attention and suggest how these could be addressed in future research. They discuss the implications of their results, both for future investigation and for clinical practice where applicable. This section usually ends with a final summary and conclusions, concerning the major findings of the study.

Acknowledgements

Although not obligatory, it is considered good form for the authors to thank anyone who contributed to the study, including participants, technical support staff and even long-suffering relatives!

References

The references section lists all the written works mentioned in the current article. Authors are obliged to cite the sources of their information and ideas. There are numerous conventions for doing this and each journal has its preferred format. The references section can point you towards further reading.

Summary

This is an overview of what to expect from a research paper, although this is not definitive and there is considerable variation in quality and style. However, hopefully you now have the confidence to find a research article of interest to you and start unravelling it. Happy reading!

Sarah Bryan PhD, MTI (reg'd), MIFPA, CNHC (reg'd), a member of the IFPA and the Massage Training Institute, is also Devon champion for the Complementary & Natural Healthcare Council. After studying speech and language science at Sheffield University, completing her PhD in 2012, she trained in holistic massage therapy and sports/remedial massage and in 2014 completed a diploma in Clinical Aromatherapy with the Penny Price Academy of Aromatherapy.

Sarah aims to develop her practice through integrating aromatherapy with therapeutic, sports and remedial massage techniques. She has recently worked with Penny Price to develop an aromatherapy products range for remedial massage and bodywork, due to launch in 2017.

Diana Newson holds a PhD in molecular genetics and has had a very varied career including work in science, publishing, management and adult education. She is a freelance researcher and published writer of both fiction and non-fiction. However, her deep passion is bodywork, and she worked for 11 years as a self-employed massage practitioner and aromatherapist. She no longer practises 'hands-on' bodywork but has a central administrative role with the Massage Training Institute.