How do you write a review of the literature for your proposal?

This is a very important part of your research study. A literature review is needed to develop your research proposal, refine your methodology and analysis and is essential for writing up your research findings. It is important to understand the difference between a literature review and a review of the literature as an introduction for a research study.

A literature review of a specific subject (as often published in journals) has to be a comprehensive review of that subject.

But when you are doing a review of the literature for your study, you start by doing a comprehensive literature review of your topic to explore the knowledge available and identify gaps in the literature so that you can develop your research question. Then you can proceed with the review of specific parts of the literature for your research study focusing on your research question.

It is important for you to realise that a review of the literature is not something that is done once-off and then left as completed. The whole time while you are writing your proposal and developing your research idea, you go back to the literature that you have already reviewed, read some more, refine your summaries and add more articles to your review. There must be a thread that can be followed through your review of the literature and link to your research question, your methods, your variables etc. Everything must link up and therefore, often when you write your method section for example, you will look back at your review of the literature to ensure that it reflects what you mention in the method section.

This step will concentrate on developing review of the literature for a research proposal.

In a review of the literature for a scientific research proposal you must demonstrate that you:

- Understand the context of the research and where it is being undertaken.
- Are able to identify what is known/not known about the research subject.
- Identify key definitions and variables already established in the literature.

- Critically analyse the limitations and difficulties in previous studies.
- Identify research opportunities in the field.
- Justify your research question.

In addition to the above, a review of the literature is also useful in discovering information that can be used in sample size calculations, appropriate methodology, data collection tools and analytical methods. Therefore remember it is an iterative process – you do your review of the literature, but then when you come to sample size calculation, you go back to review of the literature to see what other studies have used for sample size. The same with data collection tools, analysis etc.

This is a daunting task and takes lots of practice to get the correct balance between too much and too little information. Your mentor will play an important role in helping you and giving advice on key articles to read.

Listen to your mentor more than you argue with her/him.

How you do a literature search?

1. Have a clear understanding of your research idea:

To do an effective literature search you must have a clear research idea. This will help you develop key words to use in your electronic search. A published review article on your research idea is a good starting place to look for keywords. If you find relevant references in the review article, you must find and read the original articles – not all reviews quote the originals correctly! Do not restrict yourself to keywords from the review article. An advantage of using a few important articles when you do your literature search, is to see if your electronic search comes up with these articles and some other articles: if not refine your key words.

Start by looking at current review articles on the subject (Set PubMed to advanced search and choose review articles).

2. Where do you look?

The most commonly used electronic databases are PubMed, Google Scholar and the Cochrane library. It would be worthwhile to spend some time learning how to use these databases effectively.

By setting limits in PubMed, you get a focussed search. In PubMed the limits can be set under Advanced search (10 tips for navigating PubMed[1]).

1 McGill University Health Centre. 10 Tips for navigating PUBMED *http://www.muhclibraries.ca/files/2013/06/PubMed-tips_-May2013_EN.pdf*

TIP: Remember to record your search strategy.

It can be frustrating if you have seen an interesting article and you cannot find it again. One search is normally not sufficient: search and re-search should be the dictum.

Some of the newest data are not available in the formal scientific literature. To find such data you have to search other sources (grey literature) e.g. the incidence of tuberculosis (WHO Tuberculosis report).

3. How far back should you look in the literature?

You should be reviewing the current literature. It is normally recommended that you use articles no more than 2-3 years old. Let the good studies you find, guide you to ensure you read all the current literature.

In clinical research it is important not to forget older studies. Good research ideas could be based on knowing older studies and using new technology e.g. using MRi scan in TBM.

If you find a large number of articles quickly read through the abstracts to see which articles might be relevant to your study.

TIP: Find a recent good review article and make sure your search includes all the relevant articles. If you want to quote an article mentioned in a published review, you have to read the original article carefully.

4. How should you read the articles?

The articles of interest should be critically read with emphasis on:

- Summary of the article.
- Key findings.
- Methodology used.
- How the article relates to my study.
- Accurate reference.

TIP: Remember PICOT (Population Intervention Comparator Outcome Time) when reading the articles. (See Step 4: How do I develop a research question?)

TIP: Keep good accurate written notes on each article that you read.

5. How do you file the articles you have read?

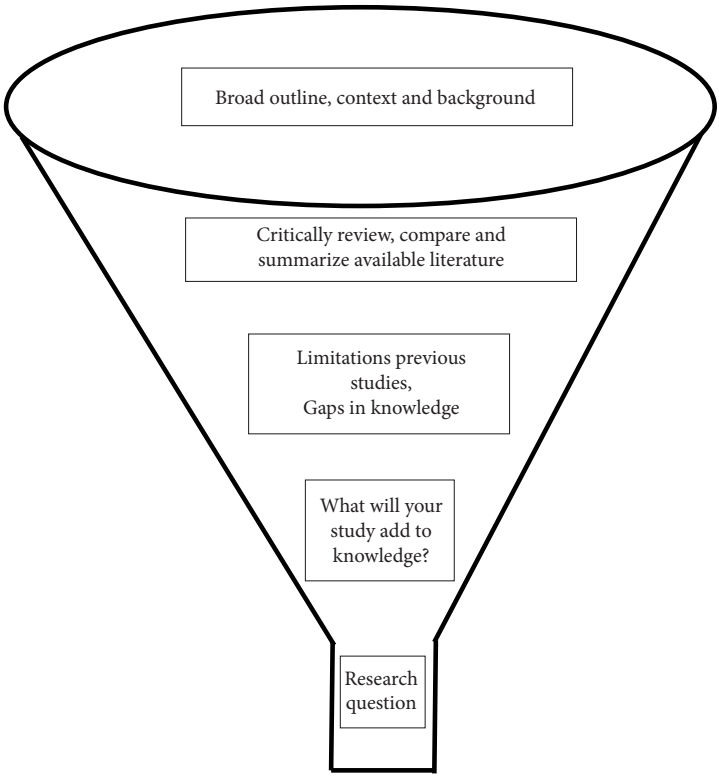
You will need the articles to develop your proposal, implement your study, refine your analysis plan and write your article(s). You must therefore file the articles so that they can be accessed, as you need them.

If you only have a few key articles you might want to just keep the hard copies. If you do a good literature search, you will discover a multitude of articles you need. It would be worth your while using an electronic reference manager. There are many commercially available reference managers (Papers, Endnote etc.). Mendeley reference manager is available as free software and is easy to use. (See appendix 2: Mendeley)

How do you write a literature review for a research proposal?

An effective review will summarise all the current articles (2-3 years), critically review their content and point out the gaps in the literature requiring further research. The gaps then lead to your research question and what your study will potentially add to the literature.

TIP: Write a review in the shape of a funnel. Start with the broad issue (context) and narrow down (published studies) until you reach the most specific research issue which leads to your research question.



How do you write the first draft?

Unless you are a genius and a cross between a person awarded the Nobel Prize for Science and a person awarded the Nobel Prize for literature, do not try to write your first draft in perfect language. First sit (or walk or ride your bicycle) and think about and then write down an outline of all the points you want to make. Once you have thought well, it is easier to write – but still do not allow yourself to get writer's block because you cannot find the perfect word or sentence. Just write down your thoughts.

"I don't mind that you think slowly but I do mind that you are publishing faster than you think". Wolfgang Pauli, physicist, Nobel laureate (1900-1958).

This quote applies not only to publishing, but also to writing – do not write faster than you think!

First paragraph:
This paragraph should give a broad outline of the problem, the context in which the study is being done and the background to the problem.

Beware of overused statements: "One third of the world's population is infected with tuberculosis". This is common knowledge and does not grab the reviewers' or readers' attention – in fact, it is just boring.

Just like in clinical medicine where you have only 2 or 3 minutes to gain the trust of your patient, when you write, you have 2 or 3 sentences in the first paragraph, to grab the interest of the reader/reviewer.

Second (and perhaps third) paragraph:
This paragraph(s) narrows down to the published research in the area you are interested in. Here you critically review the available knowledge. Compare and contrast findings by groups of authors (and give references as 3-7) rather than mentioning each study separately. Combining the findings of various published studies requires careful synthesis and understanding of the available literature. It is often useful to make a template with a row for each reference you use and a column for each of the PICOT "categories". Such a template often makes it much easier to group the literature together. These paragraphs show whether you have insight into and have really thought about the studies that you refer to.

Third and fourth paragraph:
This paragraph(s) now narrows down even further with a critical analysis of the limitations of previous studies or gaps/opportunities in the literature.

TIP: Look at previous published studies carefully and you will see that they usually mention their limitations in the last few paragraphs and often also mention future research ideas.

Fifth and possibly sixth paragraph:
This paragraph(s) should now make it absolutely clear exactly what your study is about as well as what it will add to the literature. Included in these paragraphs should be your research question.

What are common mistakes in writing the review for a scientific research proposal?

1. Too much data/information:
If there is too much data/information, especially when there is no clear connection between the various studies reviewed, you will lose your reader and not build a logical train of thought. This especially occurs if you do not synthesise the findings of the different studies.

2. Too little data:
It is often incorrectly assumed that the readers know the field and scientific issues being discussed. Be careful not to make jumps in logic. You need a good balance between too much and too little data: rather err on the side of too much data.

3. Unclear exactly what your study will contribute to the literature:
Be very clear exactly what the gaps/limitations are in the literature and how your study will address these gaps/limitations.

4. Confusing structure of the literature review:
Think through very carefully the structure of the review. Make sure there is a common thread running through the review. Your review is part of your research proposal and not a stand-alone review. Avoid mentioning facts in your literature review that you never refer to again in the methods, limitations, analysis of your research proposal.

5. Avoid personal anecdotes:
This is a scientific review and anecdotes should be avoided. If you have completed a pilot study you might consider adding some of the possible outcomes but rather save this for the feasibility section of the proposal.

6. Avoid duplication.

7. Get an early evaluation of your scientific review of the literature from your mentor.
This will help you refine your review before you re-write it.

8. Re-evaluate and re-write.
Unluckily most of us have to re-write the review a number of times.

9. And lastly – remember that your literature review is a constant process – by the time your proposal has been approved by the Ethics Committee, the chances are good that new studies have been published since you wrote your proposal. Before you implement your study, ensure that you are still up to date with the literature and if you have kept a record of your search criteria and key words, this is easy! Keep up with the newest literature throughout your study.

10. PUBMED and OVID can be programmed to give you automatic literature updates.

The C's to help you with your scientific review[2]:

Cite: Stick to cited articles or information sources, as they are your facts. Avoid personal opinion.

Compare: Compare different articles to each other looking for agreements and disagreement.

Contrast: Look for articles that disagree and contrast the strengths and weaknesses leading to research opportunities.

Critique: Identify what are the gaps in the literature and what are the research opportunities.

Connect: Synthesise what you have learned. How does this lead to your research question?

Concise: Keep your review to the point and avoid duplication.

Construct: Construct your review that it is orderly and systematic with a thread leading to your question (Funnel approach).

Check: Check that you have the newest information and re-check prior to writing your paper.

Gie, R., & Beyers, N. (2014). Getting started in clinical research: Guidance for junior researchers. Cape Town: Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University.

2 Adapted from: Literature review: academic tip sheet.. Edith Cowan University. Australia *http://intranet.ecu.edu.au/__data/assets/pdf_file/0011/20621/literature_review.pdf*