

Chapter 19

STEPS IN THESIS WRITING

(The Art and Science of Writing
Postgraduate Thesis/Dissertation)

Introduction: Submission of thesis/dissertation is a pre-requisite for the postgraduate (PG) medical degrees by most of the universities. As such, there are no comprehensive guidelines for the preparation of the dissertation either to the PG students or their guides. Writing the dissertation in an acceptable format will not only ensure its approval by examiners but will also help the young scientist in writing a good scientific paper. This chapter will provide essential guidelines to write a thesis/dissertation.

Definition

Dissertation is a treatise or a written composition that deals with a subject formally and systematically.

Thesis is a proposition stated especially as a theme to be discussed or proved or maintained against attack or an essay based on research.

Dissertation/Thesis are a proof that one cannot only do science, but also write science.

“The average dissertation is nothing but transference of bones from one graveyard to another” said Frank Dobie.

Scientific Structure (Anatomy) of Dissertation

When one think of the structure of thesis/dissertation, one is reminded of the following verse written by ‘Rudyard Kipling’ and quoted by ‘Richard Asher’ a famous medical writer in his essay “SIX HONEST MEN FOR MEDICAL WRITERS”.

I keep six honest serving men
They taught me all I know
Their names are what, why, when
How, where and who.

Thus while writing a dissertation the questions what, why, when, how, where and who should be answered.

Dissertation/Thesis proposals are designed to:

- Justify and plan (or contract for) a research project.
- Show how your project contributes to existing research.

- Demonstrate to your advisor and committee that you understand how to conduct discipline-specific research within an acceptable time-frame.

Tips to Start Thesis/Dissertation Writing

General Advice

- Establish a writing schedule, preferably writing at the same time and place each day.
- Begin by free-writing. Remember that no one but you have to see the initial draft.
- Keep a small notebook with you throughout the day to write down relevant thoughts.
- Say parts of your writing into a recording device and then play it back to yourself (if possible).
- Compose different parts of the proposal in different computer files or on different index cards to help with arranging and rearranging.
- Start with more “clear cut” sections first, rather than with the Introduction, since it may be the most difficult part to write.

Proposal-Specific Advice

- Understand that the proposal will be a negotiated document, so be prepared to draft, redraft, and resubmit it.
- Think of the proposal as an introduction to your thesis—not a chapter, not an extensive literature review, not an opportunity to rehearse the major conflicts in your field. You are “bridging the gap” between existing work and your work.
- Remember that the proposal is not a contract that determines what your thesis will demonstrate. You will likely modify and refine your scope, argument, and methods.
- Remember that your proposal is not meant to limit your ideas, but to help you think in practical terms about how you intend to research and write your dissertation.
- Ask colleagues to form a writing group that you can use to exchange ideas, drafts, and experiences. As lonely as it may seem sometimes, writing is a social activity.

Bradford Hill in 1965 evolved the **IMRAD structure** (Introduction, Methods, Results, and Discussion,), however, for our purposes we shall adopt the following structure:

- a. Title
- b. Introduction: Why you want to do study?
- c. Aims and objectives: What will you achieve?
- d. Review of Literature: What are the other studies available on same topic/subject?

- e. Material and Methods: How will you do the study?
- f. Observations/ Results: What are the findings?
- g. Discussion: What do the findings mean?
- h. Summary (including Conclusion)
- i. Recommendations (based on study findings)
- j. References (Bibliography)
- k. Annexure

Title

The title should describe the content in the fewest possible words. The title is what catches the reader's eye and deserves careful thought. The title needs to be accurate, specific, retrievable short yet sufficiently descriptive and as informative as possible. Abbreviations should not be used in the title. Paradoxical obscure or misleading titles should not be used. Do not produce long incomprehensible strings and adjectives as seen in this example: "Cytological changes in the conjunctiva in the patients with vitamin A deficiency with or without protein calorie malnutrition". At the same time the title should not be made meaningless for the sake of brevity as seen in this example "Cell block study".

Thus it is worth analyzing the title and to make sure that it contains elements of the dissertation that it is intended to convey. For example: "Conjunctival Cytology in Xerophthalmia", "Cell Block Study of Body Fluids". "Fine Needle Aspiration Cytological Study of Salivary Gland Tumors".

A good title should:

- Orient your readers to the topic you will research.
- Indicate the type of study you will conduct.

Introduction

The introduction should answer the question "why you want to do the study"? That is, why should you actually do the work? In just 500–1000 words the introduction should state:

- a. The nature and the scope of the problem.
- b. The rationale for the study.

The introduction should be intelligible and not long and pompous. It should introduce the state of knowledge before the work was started, define the gaps in knowledge which the work will fill and state what works set out to do?

A good introduction should:

- Establish the general territory (real world or research) in which the research is placed.

- Describe the broad foundations of your study, including some references to existing literature and/or empirically observable situations. In other words, the introduction needs to provide sufficient background for readers to understand where from your study is coming.
- Indicate the general scope of your project, but do not go into so much detail that later sections (purpose/literature review) become irrelevant.
- Provide an overview of the sections that will appear in your proposal (optional).
- Engage the readers.

Aims and Objectives

The objectives of the research project should summarize what is to be achieved by the study. Aim or the General Objective of a study states what is expected to be achieved by the study in general terms.

It is possible (and advisable) to break down a general objective into smaller, logically connected parts. These are usually referred to as Specific Objectives.

Objectives answer the questions like what, where, when about the study.

Objectives must be SMART:

- S – Specific
- M – Measurable
- A – Achievable
- R – Relevant
- T – Time bound

Review of Literature

This pertains to searching and recording salient and pertinent points from articles written by earlier workers/researchers on the subject that you have chosen. Record the information in chronological order. The articles reviewed should be retrievable. It is not necessary to review the entire story of the subject from Pythagoras to the present day but only relevant articles should be reviewed.

Literature Searching

“Knowledge is of two kinds. We know a subject ourselves or we know where we can find the information about it”, said Dr Samuel Johnson.

The literature review is a critical look at the existing research that is significant to the work that you are carrying out. Obviously, at this point you are not likely to have read everything related to your research questions, but you should still be able to identify the key texts with which

you will be in conversation as you write your dissertation/thesis. Literature reviews often include both the theoretical approaches to your topic and research (empirical or analytical) on your topic.

Writing the Literature Review Allows Understanding

- How other researchers/scholars have written about the topic?
- The range of theories researchers/scholars use to analyze their primary materials or data
- How other researchers/scholars connect their specific research topics to larger issues, questions, or practices within the field?
- The best methodologies and research techniques for your particular topic.

The literature review has four major functions that you should keep in mind as you write:

- It situates the current study within a wider disciplinary conversation.
- It illustrates the uniqueness, importance of and need for your particular project by explaining how your research questions and approach are different from those of other researchers/scholars.
- It justifies methodological choices.
- It demonstrates your familiarity with the topic and appropriate approaches to studying it.

Effective Literature Reviews Should–

- Take out the Introduction's brief description of the background of your study.
- Critically assess important research trends or areas of interest relevant to your study.
- Identify potential gaps in knowledge.
- Establish a need for current and/or future research projects.

Tips on Drafting Your Literature Review

- Categorize the literature into recognizable topic clusters and begin each with a sub-heading. Look for trends and themes and then synthesize related information. You should–
 1. Take out the various positions that are relevant to your project.
 2. Build on conclusions that lead to your project, or
 3. Demonstrate the places where the literature is lacking, whether due to a methodology you think is incomplete or to assumptions you think are flawed.
- Avoid “Pathak et al says that”, “Smith says X, Jones says Y” in literature review. You should be tying the literature you review to specific facets of your problem, not to review for the sake of reviewing.

- Avoid including all the studies on the subject or the vast array of scholarship that brought you to the subject. As tempting as it might be to throw in everything you know, the literature review is not the place for such demonstration. Stick to those pieces of the literature directly relevant to your narrowed subject (question or statement of a problem).
- Avoid polemics, praise, and blame. You should fight the temptation to strongly express your opinions about the previous literature. Your task is to justify your project given the known scholarship, so polemics, praise, and blame are unnecessary and possibly distracting.

Key Points: After assessing the literature in your field, you should be able to answer the following questions:

- Why should we study (further) this research topic/problem?
- What contributions will my study make to the existing literature?

Detailed literature search has been dealt in chapter 3. Please read carefully.

Materials and Methods

This section is essential and important to most good research proposals. How you study a problem is often as important as the results you collect. This section includes a description of the general means through which the goals of the study will be achieved: Methods, materials, procedures, tasks, etc.

An effective methodology section should:

- Introduce the overall methodological approach for each problem or question. Is your study qualitative or quantitative? Are you going to take a special approach, such as action research, or use case studies? Is it observational or experimental?
- Reference population, study population, study subjects, sample size and sampling methods to be decided at the beginning of the study.
- Indicate how the approach fits the overall research design. Your methods should have a clear connection with your research questions and/or hypotheses. In other words, make sure that your methods will actually answer your questions or stated objectives, i.e. write in detail about “the proposed tests, or methods, or scientific procedures, etc. One should also include inclusion, exclusion, eligibility and diagnostic criteria especially in medical and health research.
- It is necessary to mention independent and dependent variables.
- Describe the specific methods of data collection you are going to use—e.g. surveys, interviews, questionnaires, observation, archival or traditional library research.
- Methods for Data Quality Control to be described.

- Various procedures to ensure ethical considerations in your research with human subjects.
- Explain how you intend to analyze and interpret your results. Will you use statistical analysis? Will you use specific theoretical perspectives to help you analyze a text or explain observed behaviors?
- If necessary, provide background and rationale for methodologies that are unfamiliar for your readers. (Typically, the social sciences and humanities require more explanation/rationale of methods than the hard sciences).
- If applicable, you may also need to provide a rationale for subject selection (particularly if you have not already provided one). For instance, if you propose to conduct interviews and use questionnaires, how do you intend to select the sample population? If you are analyzing literary texts, which texts have you chosen, and why?
- It is necessary to explain various terminologies and standards which will be used in your research.
- Whether preliminary test run/poilet study will be done, if so how?
- Address potential limitations. Are there any practical limitations that could affect your data collection? How will you attempt to control for potential confounding variables and errors?

Results: This section must answer the question “What did you find”?

The description of the results of your work is the heart of your thesis/dissertation. It is the communication of facts, measurements and observations in your work. In this section you might like to include illustrations, like photograph, sector graphs histograms, pie charts, tables and so on. Remember that illustrations should not be used as ornaments but should support the text and aid in clear description and concise explanations, use them to help convey the information accurately and succinctly.

All photographs should have a figure number written in Arabic numerals a short caption or legend and in case of photomicrographs the stain used and magnification should be written, e.g. Fig. 1 Mast cell with dense granules obscuring the nucleus. Toluidine blue x 100.

Tables should be numbered in Roman numeral, e.g. Table I.

Clear writing is an expression of clear active voice that should be used. By changing the passive verb, e.g. “was achieved” to active verb “improved”. As far as possible, write in past tense. Punctuators particularly commas, full stops and quotation marks should be used carefully as wrong usage can alter the meaning totally for example–

Go, slow work in progress.

Go slow, work in progress.

“The Managing Director” said the Chairman, “is a fool”

The Managing Director Said, “the Chairman is a fool”.

Discussion: Answer the question “what do the results mean?”

This is the most difficult aspect of dissertation/thesis writing. It should include the following:

- a. Present principles, relationships and generalization shown by the results.
- b. Point out exceptions and lack of correlations.
- c. Indicate agreement or contrast with previously published work.
- d. State the implications of your results.
- e. Give reasons for your conclusions.
- f. Mention the limitations of your work.
- g. Indicate scope for further work.

It is in the discussion that the author incorporates his contribution into existing knowledge. At its fullest, the discussion will want to do lots of things; it should recapitulate the main findings, discuss the methods you used if there is something interesting or unusual about them, discuss the results of other people those that conflict with yours and those that confirm them and argue the case of your results against those that conflict saying why yours are more convincing. Do not simply say that they disagree and other agree; there has to be some argument. And finally say what the implications of your study are or that more research is needed.

When discussing the conclusions of other workers, one should clearly state their origins and quote them correctly bearing in mind that unfavorable comparisons with previous work do not increase the merit of one's own work. It is better to show how one's results correct a false impression or lend themselves to a different interpretation.

Summary and Conclusions

The summary should concisely describe—

- a. The problem
- b. The solution
- c. The principal conclusion(s)

In the summary, avoid experimental details and references to previous work. Do not draw wrong conclusions.

References

Under this there are two aspects, viz. citing of references in the text and listing of references in the list of references.

There are two styles for citing and listing: Harvard style and Vancouver style.

Citing of References

Harvard style: When there are three or less authors : Write all with their surnames and the year of publication, e.g. The occurrence of prostatic

tissue in a retroperitoneal teratoma has been observed by earlier workers (Kini, Raghuvver and Pai 1991).

When there are more than three authors, write the surname of only the first author, et al and year, e.g. the presence of psammoma bodies in papillary carcinoma has been observed by many workers in the past.

Vancouver style: Irrespective of the number of authors, write only the reference number as shown in this example:

Earlier workers have observed that endometrial hyperplasia is a pre-cancerous condition.¹

Listing of References

Harvard Style

References are listed in alphabetical order irrespective of the order of their appearance in the text.

Vancouver Style

References are numbered according to their appearances in the text and listed accordingly. As per International Committee of Medical Journal Editors, uniform requirements for manuscripts submitted to biomedical journal are available in the following articles:

- Br. Med J 1988; 296: 401-405.
- Ann Intern Med 1988; 108: 258-265

Some Examples of Writing the References

1. **Standard Journal Article:**

(List all authors when six or less; when seven or more, list only first three and add et al) Savitha Sodhi, Harsh Mohan, TS Jaiswal, Praveen S Mohan, Susheela Rathee.

Should be written as

Sodhi S, Mohan H, Jaiswal TS, Mohan PS, Rathee S. Placental pathology in pre-eclampsia syndrome. Indian J Patho Microbiol, 1990; 33:11-16.

2. **Book: Personal Author(s)**

Eisen HN. Immunology: An introduction to molecular and cellular principles of immune response. 5th edn. New York : Harper and Row, 1974: 406-408.

Rosai J Breast. In: Ackernman's surgical pathology. 8th edn. St Louis Baltimore: Mosby 1996:1565-1568.

3. Book: Chapter in a book

Kobzik L, Schoen F. The lung In: Cotran RS, Kumar V, Robbins SL. Robbins Pathologic basis of disease. 5th edn Philadelphia: WB Saunders Co. 1994: 673-734.

4. No author given

Anonymous. Cofee drinking and cancer of the pancreas (Editorial). Br. Med J: 1981;283:628.

5. Agency Publication

AFIP publication:

Scully RE. Tumors of the ovary and mal-developed gonads. In: Atlas of tumor pathology second serried Fasc. 16 .Washington, DC, 1979, Armed Forces Institute of Pathology.

WHO Publications

Enzinger FM, Lattes R, Torloni H: 1969. Histological typing of soft tissue tumors. Geneva, World Health Organization (International Histological Classification of Tumors, no. 3).

Epilogue	
<i>DO- please - Spare me</i> packets tattered,	Photographs all bent and battered
References in random order,	Obscure words typed off the border
Figures roughly drawn free hand,	Jargon none can understand
Flimsy paper, just one copy;	
<i>Write instead such splendid text</i>	That no guide is vexed
clearly typed with margins wide,	Room for comments at the side
English that is clear and concise	Lacking jargon, quite precise
Figures cleanly drawn and lettered	Photographs that cannot be battered
So that I can say quickly-	
'APPROVE THIS DISSERTATION WITHOUT HESITATION.'	