

Supplement 2. Requirements to the PhD thesis for earning the educational and scientific degree Doctor of Philosophy (PhD)

I. Structure and Content of the PhD thesis Chapters

1. Introduction

Summarizes the scientific extent of the PhD thesis and provides an overview of the investigated problem, as well as its significance (relevance, contribution) for the scientific field.

2. Literature Review

Presents the existing body of knowledge in the field of the PhD thesis. Demonstrates wider theoretical understating of the problem at hand. Candidates should demonstrate profound knowledge of the sources in the field and understanding of the most significant theoretical and methodological issues.

However, the literature review is not merely a Bibliography. It should be a survey and critical assessment, and to be short and meticulous. It should not include irrelevant sources or digress from the subject. Key studies that have been acknowledged as creative (original) in the study field should not be ignored.

The literature review should address certain issues or ambiguities that require further research. It should underline the significance of the thesis in terms of its contribution to the explored question and to the scientific knowledge gathered so far. The literature review should naturally outline the scientific problem explored in the PhD thesis.

It should identify the significance of the studied scientific problem.

3. Aim, Objectives, Materials and Methods

The aim of the PhD thesis should be precisely formulated, and the single stages of the study should be presented as separate objectives. The studied scientific problem should be presented shortly and clearly, along with a number of carefully defined scientific hypotheses, speculations or questions to be studied by the dissertation.

Since it is not always easy to choose the most appropriate methodologies or approaches, candidates should be able to defend their choices using the appropriate argumentation in every single case.

The dissertation may use mixed methodologies or approaches originating from various scientific fields.

The candidates should demonstrate that their choice of methodologies or approaches is based on sound reasoning and that the criteria, as well as the pros and cons of the individual methodology selection, are well defined.

The methodologies, the collected and processed data and the sequence of the single study stages should be precisely and clearly described in the thesis in order to provide easy understanding of the study, as well as for the exact reproduction by other scientists.

4. Results

- a) the research results should be presented as detailed as possible in order to prove their sufficiency for the achievement of the study's aim and objectives;
- b) each problem should be identified in the discussion and a suitable solution should be suggested;
- c) for quantitative studies, candidates should suggest an appropriate statistical evaluation of the explored problem by means of an analysis of the reliability, the methodological errors and the deviation sources;

- d) candidates should understand their own speculations (assumptions) and to interpret the applied statistical tests or exams;
- e) where appropriate, candidates should demonstrate imagination and analytical thinking while identifying and analyzing eventually unexpected data or properties;
- f) the analysis (discussion) should clearly refer to the postulated hypotheses, assumptions or scientific issues that are integral to the presented scientific problem;
- g) candidates should be able to prove their solution in the course of the general presentation of the key data in the text, and to identify the primary and secondary data;
- h) data should be presented in a well structured and orderly manner (tables, figures, graphics, results of clinical indicators, exams, tests, chromatograms, X-ray photographs and similar visual aids);
- i) bottom-line, candidates should be able to demonstrate WHY each separate analysis has been carried out and WHAT this analysis reveals about the gathered data.

5. Discussion

- a) the discussion should summarize (without any unnecessary repetition of the results) the achievements of the study and compare them with the existing body of knowledge;
- b) the contribution of the dissertation to the study field should be assessed;
- c) the candidate's own work should be related to the existing body of knowledge as already discussed in the literature review;
- d) the major findings should be interpreted and related to theory (and where applicable – to praxis);
- e) the study should reflect on the studied process as whole. This will demonstrate the candidate's knowledge gathered in the course of work on the dissertation;
- f) the limitations of the study and the methodology, along with an additional or alternative approach, may also be discussed in the light of the newly acquired knowledge;
- g) possibilities for future research, whether by the candidate or by other researchers, should also be outlined;
- h) identification of concrete problems requiring future research should be attempted.

6. Conclusion and Recommendations

A summary of the study's most significant conclusions and contribution, of the experiments learned and how these can be applied. If needed, recommendations can be made to particular individuals or legal entities, e. g. government authorities, etc.

7. Appendices

Bulky data and body of evidence that do not fit in the results chapter may be included in an appendix or appendices to the thesis in order to provide validation of the results.

8. References

All sources used in the study are listed in compliance with the editorial requirements of scientific medical magazines (the so-called Vancouver style) or the Bulgarian State Standard (also known as BDS). Sources that were not cited in the review but significantly influenced the approach to the research are also included.

II. Presentation and Clarity of the PhD thesis

1. Style and Form of the PhD thesis

- a) the text should be easily readable;

- b) the text should be clear and analytical;
- c) the presentation of the study should be understandable to the reader, who should be able to follow, to localize tables, figures and references in the text. The consecutive numbering of the chapters, sections and sometimes paragraphs is mandatory.
- d) the style should be compact – no unnecessary repetitions or citations;
- e) the references should be precise and exhaustive, containing all details of the cited sources;
- f) the thesis should offer an easy access to data and to interpretations and explanations;
- g) the thesis should not exceed the necessary length. The research supervisor evaluates the volume of the thesis.

2. Cohesion and Coherence

The separate parts of the thesis should be logically and rationally interconnected.

3. Scientific Contribution

The PhD thesis should largely comply with the required publications number as set forth by the qualitative and quantitative criteria of the Sofia Medical University. The candidates should present the thesis's parts that have been accepted for publishing in the necessary scientific periodicals, in original or accompanied by an editor's note of admission. A list of references to the thesis and other proof of scientific contribution (patents, industrial implementations and the like) should be attached to the abstract.

4. Reliability / Credibility (originality, authenticity) and Creativity

The study and the thesis should be the candidate's own work. The extent of demonstrated independence may vary according to research subject as sometimes researchers work as a part of a team, while on other occasions the work can be carried out alone. The candidate should demonstrate an appropriate level of independent work or to confirm a significant personal contribution to the scientific developments. The candidate should be able to define and to prove the thesis contribution to the study of the problem at hand.