

Special Article

Common Errors in Proposals and Dissertations and How to Avoid them: A Resident's Guide

Osita Ede¹, Cajetan U. Nwadinigwe², Iheuko S. Ogbonnaya², Gabriel O. Eyichukwu², Chukwuemeka B. Eze³, Amechi U. Katchy⁴, Ugochukwu N. Enweani⁵

¹Department of Orthopedic Surgery, National Orthopedic Hospital, Enugu, ²Department of Plastic and Reconstructive Surgery, National Orthopedic Hospital, Enugu,

³Department of Orthopaedic Surgery, Millennium Specialist Hospital, Enugu, ⁴Department of Accident and Emergency, University of Nigeria Teaching Hospital, Ituku-Ozalla, ⁵Department of Orthopaedic Surgery, City Clinics, Enugu, Nigeria

Abstract

Background: The dissertation is now a necessary part of the fellowship examinations of both the West African college of surgeons and physicians and the national postgraduate medical college of Nigeria. Many resident doctors are confused about how to get on with their proposals and the dissertations. This confusion often leads to frustrations, and in extreme cases to unnecessary delay in attempting the examinations when due. **Aim:** This study aims to identify the common errors made by resident doctors in the proposal and dissertations and to recommend the solutions to such problems. **Methods:** This survey is based on a direct interview with experienced examiners in both colleges. The examiners were asked to list what they observed as the common problems they identified concerning the proposal and dissertation of residents. The answers were collated and categorized according to the frequencies of problems identified. Based on the response of the examiners, a questionnaire was designed and administered to the senior residents who are at various stages of writing their dissertations. **Results:** Some of the findings include starting the proposal too late, difficulty in choosing a topic, mediocre and tedious literature search, difficulty in finding appropriate supervisors, poor appreciation of basic research design and necessary statistical tests, improper presentation of results and wrong referencing. Others are editorial mistakes, pagination errors, and the lack of knowledge on proper attitude and skill during the defense. **Conclusion:** Starting too late is the most common error made by the resident doctor in the dissertation. Residents should choose a topic within 6 months of passing the membership examination.

Keywords: Dissertations, errors, proposals, resident doctors

INTRODUCTION

The dissertation is a requirement for the award of a degree in many academic fields. In our clime, it is a compulsory part of the final fellowship examination in both the West African College of Surgeons (WACS) and the National Postgraduate Medical College of Nigeria (NPMCN). Candidates are expected to pick a topic of interest in their field and conduct research with objectives that mainly is required to contribute to improved practice in the discipline. They are required to choose supervisors who are expected to be experts in the field to guide them in the study. The candidate is then required to defend the work in the examination before assessors chosen by the colleges. A pass in the dissertation is necessary for the candidate to pass the examination.

Because of the importance of the dissertation to the fellowship examinations, the Colleges conduct a biannual course on research methodology. This course is intended to equip the fresh senior

registrar who has just passed his membership examinations with the knowledge to do research. In the NPMCN, this course lasts for 1 week, while it lasts for 2 days in the WACS. The course is usually supplemented with both electronic and physical materials to serve as instruments for further learning. It is hoped that the resident who attends such a course will find it easy to execute the proposal and dissertation with minimal trouble.

However, many resident doctors are still confused about how to get on with the proposal and dissertation. Anecdotal evidence

Address for correspondence: Dr. Osita Ede,
Department of Orthopedic Surgery, National Orthopedic Hospital,
P.M.B 01294, Enugu, Enugu State, Nigeria.
E-mail: edeosita@yahoo.com

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shows that the average time a resident starts the proposal is 12–15 months postmembership examination. The delay by the resident results in a hurried formulation of a research topic. Consequently, such work often is poorly designed and riddled with methodological deficiencies. The anxiety is worsened when the candidate realizes he has to get approval from the college not later than 15 months to the date of the examination in view. This confusion often leads to frustrations, and in extreme cases to unnecessary delay in attempting the examinations when due.

Hence, the authors decided to determine the common causes of this dilemma and to proffer solutions to them. The authors believe that interview with residents will reveal reasons for the delay in starting the proposals and also highlight the areas of common problems. It is also the authors' belief that a direct interview with experience examiners in both colleges, who have examined many dissertations, will also expose common errors residents make with regard to formulating a research topic, conducting the study and in defense of the dissertation in the examinations.

METHODS

This survey is a direct interview-based study involving examiners in both colleges and resident doctors at various stages of the dissertation. The examiners are all based in, or affiliated with National Orthopedic Hospital Enugu (NOHE). A total of 16 examiners and 36 resident doctors were interviewed. The examiners were asked to enumerate the common problems they observe affecting the residents in the dissertation writing and defense. They were asked to specifically address issues in the study conception, literature review, design of the methodological steps, discussion of the results, referencing, the defense in the examination, and any other issues they frequently observe. They were also asked to proffer solutions to such problems. Based on the responses of the examiners, a questionnaire was designed, which focused on the various stages of the dissertations.

The residents include senior residents who are at least 6 months postmembership. Both those in NOHE, University of Nigeria Teaching Hospital and Enugu state University Teaching hospital were interviewed. A total of 36 senior residents out of 48 have started their proposal and hence completed this interview. Specifically, residents were asked how long postmembership they started the proposal, whether they find it easy selecting a topic and in choosing a supervisor. Problems with searching for and reviewing literature were also inquired.

They were asked if they consulted their supervisors at critical stages of the work and whether they involved a statistician in the design of the methodology. Question on the basic understanding of statistical concepts that will enable interpretation of the results was asked. Such concepts as the appropriate statistical tests, *P* value, confidence intervals and the rules regarding the use of tables and charts were asked. Other questions on the use of online software for editorial

errors and plagiarism, understanding the rules of the Vancouver referencing system, and checking the work for mistakes after submission for the examinations were also noted. The results were presented in texts, table, and chart.

RESULTS

The 16 examiners identified 13 key areas candidates have difficulties. This is shown in Figure 1 and enumerated below.

Choosing a topic

The common mistakes include starting too late (later than 6 months postmembership), (100%), choosing a difficult/uninteresting topic (85%), and asking people to choose topics for them (20%).

Choosing a supervisor(s)

Residents select supervisors based on the likeability instead of knowledge ability of the consultant (64%).

Literature search and review

The following errors are common; lack of knowledge on how to utilize the available online search engines such as Google Scholar, HINARI, PubMed, etc., (27%). Scanty literature search (82%), quoting literature without a critique of the works (40%), and citing research not directly related to the stated objectives (40%) were identified. Furthermore, plagiarism (63%), editorial errors such as paragraphing errors, spelling, punctuation and grammatical mistakes (63%), and failure to search for local works related to the study (48%) are universal problems too.

Research methodology

Recurring errors include the lack of understanding of the different types of research design such as surveys, experimental study, case-control or cohort study (60%), lack of knowledge of basic sampling methods, and randomization techniques when applicable (51%). Furthermore, failure to carry out a pilot study to assess the feasibility of the intended research

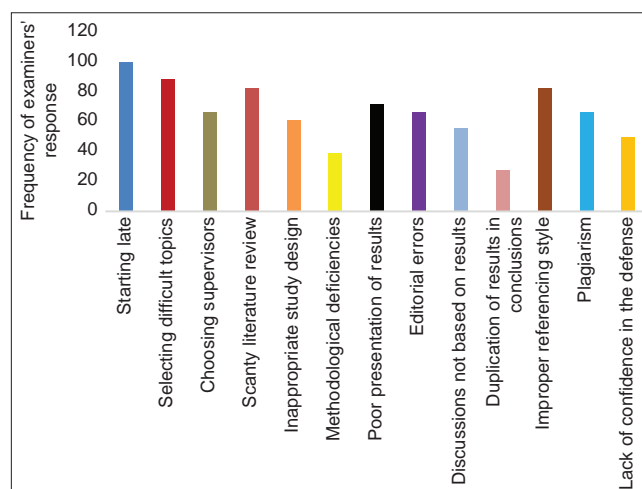


Figure 1: The response of the examiners on the area candidates has challenges with the dissertation. This shows that the most common problem facing residents is starting the proposal too late (Original)

is common (60%). Others are wrong sample size calculation for the study design (50%), inappropriate statistical tests for their hypotheses (55%), and failure to state their role in the study (32%).

Writing the results

Here the common mistakes include overrepresentation of the same result in texts, tables, and charts (65%). Others are the presentation of sociodemographic data not related to the study objectives (33%), for example, the occupation of the participants in a study of the effectiveness of tranexamic acid in reducing blood loss in total hip arthroplasty, failure to follow guidelines in using tables and charts (22%), and inability to interpret *P* values and confidence intervals in inferential studies (15%).

Writing the discussion

Duplication of the results in the discussion section (37%) and failure to base the discussion on the findings of the study (58%) are the most common mistakes.

Conclusion and recommendations

Failure to base these on the results of the work (25%) is quite common.

References

Failure to use the recommended Vancouver style (82%), mismatch between the references and their corresponding in-text citations (65%), confusion on the number of author names before writing *et al.*, (70%) referencing works based only on the abstracts (30%), failure to read the articles before referencing them (14%), and putting references after appendices (11%).

Other recurring errors (100%) include missing pages, duplicated pages, a wrong sequence of page, figure or table numbering, inverted pages, failure to update the table of contents, and the abstract page in the dissertation and not changing the future tense of the proposal to the past tense of the dissertation.

Dissertation defense

The most common errors are the failure to note mistakes observed after the submission of the dissertation (66%) and lack of confidence during the defense (45%).

Thirty-six residents were interviewed on the challenges they face with the dissertation. Their response is shown in Table 1. Responses are expressed as absolute values with the percentages enclosed in brackets, and values are rounded off to the nearest whole number. Again, starting too late ranks highest, the mean time resident doctors at NOHE start their proposal is 14 months (standard deviation = 4.7 months) postmembership examinations. Difficulties in selecting topics and choosing supervisors followed in the prevalence.

Discussion and recommendations

It is impossible to exhaust the list of errors regarding the proposal and the dissertation. However, the ones listed above

Table 1: The responses of the residents

Questions	Yes (%)	No (%)
1. Have you started your dissertation proposal?	36	12
2. Did you start your proposal within 6 months of postmembership? (<6 months)	9 (25)	27 (75)
3. Did you find it easy choosing a topic?	9 (25)	27 (75)
4. Did you find it easy choosing a supervisor?	11 (31)	25 (69)
5. What informed your choice of a supervisor?		
6. Did you consult your supervisor at each stage of the work?	15 (42)	21 (58)
7. Did you do a pilot study before embarking on the actual work?	15 (42)	21 (58)
8. Was the literature search and review easy?	12 (33)	24 (67)
9. What material did you consult in your literature search?		
10. Did you check for plagiarism?	1 (3)	35 (97)
11. Did you use third-party software to check for editorial errors?	2 (6)	34 (94)
12. Did you consult a biostatistician in the design of your methodology?	7 (19)	29 (81)
13. Do you understand basic research design, including study design types, sample.size, calculation, sampling_techniques_and_randomization?	12 (33)	24 (67)
14. Do you understand the interpretation of p-value and confidence intervals?	10 (28)	26 (72)
15. Did you read the college guidelines on the proposal and dissertation?	5 (14)	31 (86)
16. Do you understand the Vancouver referencing system?	10 (28)	26 (72)
17. Did you know you should check for mistakes after submission of the work for the examinations?	12 (33)	24 (67)

deserve further clarifications. The problem of choosing a topic late might be attributable to the misconception among residents that there is ample time after passing the membership examination. The resident may also feel that choosing a study is an easy task, one that could be done within hours or at most days. A topic should ideally be selected within 6 months after passing the membership examination. He should choose a topic that interests him, do a proper and detailed literature search to ensure there are sufficient works done on the subject. A thorough literature review will also help him to refine the study objectives better.^[1-4]

He should also do a pilot study to ascertain the feasibility of the intended research. A pilot survey helps to answer if the study can be completed within the projected time frame. Unforeseen difficulties during study conception and design such as issues with sample size and methodological nuances can be unmasked during such study. It is also a prudent thing to consult a biostatistician at this formative stage to assess the appropriateness of the design and the statistical feasibility of the objectives.

In choosing a supervisor, the resident must bear in mind that this is not a popularity contest. One does not select a supervisor because one likes him. One chooses a supervisor because the

latter is knowledgeable both in basic research methodology and the topic of interest. Regular consult with the supervisor at each stage of the work is critical. Apart from helping the resident to refine his objectives, the supervisor can also point out relevant literature on the study. As an expert in the area of research, the supervisor may know works, particularly local works that may not be easily sourced from the internet.

The literature search and review are the rate-limiting steps in writing the proposal. The key is to break it into smaller headings and do them one after the other. Trying to rush and write everything within a week will get one confused and discouraged. The literature review is more straightforward when based on the objectives of the study. This presupposes that the resident has made some provisional objectives which will guide him in the literature search. The search can be done in the local library, using Internet engines such as HINARI, Google Scholar, PubMed Central, or asking the supervisors, and colleagues.

In writing the literature review, it is better to use simple language and clear, concise sentences. Critique the work, not just lifting and quoting it verbatim. Ask if the conclusion is based on the results and if the results derive logically from the methodology. Enquire if the appropriate statistical tests were used and if the sample size was enough to guarantee adequate power to the study. Are there sources of bias in the sampling techniques or method of randomization? Critiquing literature requires experience and is greatly facilitated if the resident regularly participates in the institution journal review sessions.

The EQUATOR project (Enhancing the QUALity and Transparency Of health Research) is an initiative developed by the United Kingdom National Knowledge Service to enhance the quality of reporting health-related research.^[5] Many guidelines have been developed under this project to guide researchers in reporting their work based on the study design. Hence, there is preferred reporting items for systematic reviews and meta-analyses guidelines for Meta-analysis and Systematic reviews,^[6] consolidated standards of reporting trials for parallel-group comparative study design,^[7] the strengthening the reporting of observational studies in epidemiology for cohort, case-controlled and cross-sectional studies.^[8] The resident should familiarize himself with the above guidelines; for it would boost his ability to properly critique an article and guide him in the design of the methodology depending on his study design.

Editorial errors can be reduced by repeatedly proof-reading the work and giving it to others also to read. However, many powerful online tools can be helpful. They include Grammarly, Ginger, Language tool, and Writing Assistants. While they all have free versions, the full arsenal of the software can only be assessed in the paid versions. Remember that in-text citations are superscripts, enclosed before a comma or after a full-stop. Plagiarism can be an inadvertent occurrence, and it is helpful to use online plagiarism software such as Duplchecker, although the paid version of Grammarly has an in-built plagiarism checker. The aim to keep your similarity index below 15%.

Designing the methodology and choosing the appropriate analytical tools to test the hypotheses requires an understanding of basic statistical concepts. The resident has to determine if his work is an experimental (interventional) or nonexperimental (correlational) study. If it is experimental research, is it a quasi-experimental or a true experimental design. A true experimental study requires a control group and randomization of subjects, for example, is a clinical trial. If it is a correlational study, is it a longitudinal study in which participants are followed up in time to determine the outcome of some exposure (cohort study), or one in which a variable is measured at a particular point in time without the need for a follow-up (cross-sectional/prevalence/survey study). The EQUATOR guidelines discussed in the previous paragraph will help the resident in this section.

Sample size calculation and sampling techniques are the other areas where a lot of resident doctors blunder often. The sample size depends on the research design, the intended power of the statistical test, the chosen significance level and the chosen precision.^[9] There is no one size fits all formula for sample size estimation. The formula for a comparative study is different if the outcome is a qualitative variable like the prevalence of a disease or quantitative like the mean cholesterol level in a population. It is also different from a survey, a case-control or a cohort study. Once calculated, the resident must never use a smaller sample than the estimated value as doing so invalidates any conclusion reached from the study. This is because the calculated sample size is the minimum that is required to guarantee that the statistical test will have the chosen power level to detect a difference if one truly exists in the population.

Sampling is defined as the process of selecting the participants from the population and is of two types: Probability or nonprobability sampling. Probability sampling removes researcher bias and gives participants an equal chance of being selected for the study. Such a method includes simple random sampling, stratified random sampling, and cluster random sampling. A nonprobability sampling includes convenience sampling and voluntary sample response.

Choosing the appropriate statistical tests to use for the analysis depends, among other things, on the nature of the independent and dependent variables. If the dependent variables are continuous, parametric tests such as the student's *t*-test, analysis of variance, correlation or linear regression can be used. However, if the variables are categorical, nonparametric tests such as the Chi-square tests, Mann-Whitney tests, or Logistic regression can be used. Of course, this is an oversimplification, and the researcher is advised to consult with a biostatistician at this stage.

The results must be based entirely on the stated objectives of the study. Each objective has a null hypothesis which the researcher must either reject or fail to reject depending on the value of the chosen significance level. The value of the *P* value indicates the strength of the decision; hence, a *P* value of 0.003 is stronger than a *P* value of 0.03, even though in both cases

we reject the null hypothesis if we have chosen a significance level of 0.05, therefore, it is better to state the exact *P* value. Present each finding in either text, table, or chart. It is redundant to overrepresent one result using more than one format.

It is vital to obey table and chart rules while writing the result. A full stop is used at the end of the captions of tables and figures. For tables, legends are on top since tables are read from top to down and should not exceed the width of Table 1. Arrange the rows and columns by size to give it an order, round off numbers to enable a quick mental arithmetic calculation and leave a gap every three or four rows to make it readable. Tables should be able to stand alone and still be interpretable. Additional information on the topic, which is relevant but not important enough to interrupt the flow of the text, must be presented in footnotes. Footnotes must be placed at the foot of the page, printed in smaller type (font size 10) and single-spaced. Footnotes must be numbered consecutively.^[10,11]

For charts, including graphs and legends are on the bottom since charts are read from bottom to up. Avoid background colors and beautifications (chart junk) and remember to put the units of measurements on the axis labels.

Like the results, the discussion must be based on the results. Avoid the temptation of discussing other related observations not covered by your objectives and methodology. Discuss your findings in the light of other works, highlighting similarities and differences.^[12-14] Where feasible, proffer explanations for the areas of discrepancies between your work and other similar works. It follows logical reasoning that the conclusions and recommendations must be based only on the results of the study.

The references can be a difficult task if the resident has not made adequate preparation for it. There are hosts of referencing software that has simplified the process. The examples include Zotero, Mendeley, and Endnote. However, the resident has to manually check the references to ensure it complies with the recommendation by the College. Both Colleges use the Vancouver referencing style, and information on how to use it is freely available on the internet.^[15,16] The researcher is strongly encouraged to look it up. Having too many references, in the range of 100's, may cast doubt on whether the candidate read all the articles. The references must be arranged in the order in which they appear as in-text citations, and they should precede the appendices.

Having completed the dissertation write-up and ready for submission for the examination, it is essential to do some necessary checks. Update the table of contents, the abstract page and the referencing for the discussion section. The abstract page of the proposal will only have the background, aim and method sections, while that of the dissertation will include the results, discussion and conclusion sections. Change the future tense of the proposal to the past tense of the dissertation. Ensure all the printed copies of the work correspond in the paginations; it is embarrassing to have your

page 5 correspond to page 6 of the examiner. Check for missing pages, duplicated pages, a wrong sequence of page, figure or table numbering, and inverted pages.

In the defense proper be calm and composed. It is your work, and you are in charge. Practice summarizing your work before colleagues before the examination. Practice till you can effortlessly summarize your research within 5 min, bringing out all that is important in the study. Note and write down mistakes noticed in the project after submission for the examination. Give your work to a colleague to go through; they may pick errors that you or your supervisors missed. Finally, be confident but not arrogant in your defense.

CONCLUSION

Writing the proposal and dissertation should not be an impossible task for the resident doctor. Early commencement of the project and regularly consulting with the supervisors at each critical stage of the work will see him through with minimal troubles. We hope that the resident will find this article helpful and use it as a light source to navigate through the dark waters of the dissertation.

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Conflicts of interest

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