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Review Article

How to Write a Research Proposal

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Abstract

A structured written research proposal is a necessary requirement when making an application for research funding or applying to an ethics committee for approval of a research project. A proposal is built up in sections of theoretical background; aim and research questions to be answered; a description and justification of the method chosen to achieve the answer; awareness of the ethical implications of the research; experience and qualifications of the team members to perform the intended study; a budget and a timetable. This paper describes the common steps taken to prepare a written proposal as attractively as possible to achieve funding.

Keywords: Research proposal; Methodology; Ethics committee; Funding; Budget

Introduction

An attractively prepared research proposal is crucial for achieving sufficient resources to conduct a successful project or study. Funding agencies that sponsor research use a proposal as the basis for making their funding decisions. Some agencies request a two-step proposal; the first is a brief plan of the project, and, when accepted, a more detailed proposal has to be submitted. Funding agencies often supply an application kit that includes the forms to be completed and specific format for organizing the content of the proposal [1]. The ethical committee requires a research plan to be able to judge whether the intended project is ethically acceptable [2].

There is considerable similarity in the type of information that is expected in research proposals, and in this article, we will describe several of these important aspects of writing a research proposal.

Synopsis

A proposal often begins with a summarized overview of the proposed research project. It should not be more than one full page stating the study objectives, sample and size, methods to be used, duration and evaluation methods.

Background to the Problem

In the background section of the proposal, the researcher should make the reader aware of what has already been done and what is already known in the area. A description of how the literature search and assessment has been performed is important, as the result should be what the intended research is built upon and provide justification for the present study. It should strengthen the author's argument concerning the significance of the study, and point out how the proposed research will augment that knowledge

and why this is important. Not all studies result in an immediate product or change of praxis, but may constitute a little brick in the building of something bigger, which hopefully is supported by the funding agency. The problem that the intended research will address is ordinarily identified early in the proposal and should be stated in such a way that its importance is apparent to the reviewer, although the researcher should not promise more than can be produced [2-4].

The background should demonstrate the researcher's command of current knowledge in the field, forming a logical reason ending in the research question. A broad and complex problem is unlikely to be solvable or manageable and is likely to be deemed unethical to conduct. If relevant, include the possible theory applicable in the field so that the intended study can be put into a research context. Whenever the theoretical backgrounds of the study, existing knowledge, or the researcher's experience permit an explicit prediction of outcomes, these predictions should be included in the proposal.

Significance of the Problem

The proposal must clearly describe how the proposed research will make a contribution to existing knowledge and why it is important. Funding bodies are interested in developing knowledge based in particular areas and not in the researcher's personal journey or general curiosity. The proposal should indicate the expected generalizability of the research, its contribution to theory, possible applications or consequences of the knowledge to be gained, and its potential of improving nursing practice and patient care.

Objectives

Specific, achievable objectives provide the reader with clear criteria against which the proposed research can be assessed, and this section should be kept short and clear. Statement of a research hypothesis or specific model to be tested is preferable as it can be defined as true or false. The outcome variables should be clearly defined as primary and secondary objectives, measuring the appropriate items. Complicated and numerous research objectives often lead to no result at all, and should be avoided. In exploratory or descriptive research, the formulation of hypotheses might not be feasible, and in such cases, the objectives may be most conveniently phrased as answerable questions.

Research Questions

Research questions help the reader to identify which variables are going to be measured. First, the questions should be relevant when judged in relation to the introduction and the objectives. Second, the questions must be researchable and answerable using appropriate research methods. Thus, the approach suggested by the research questions adds something new to the knowledge base. A systematic review of different research questions is an important part of the planning process. If this is carried out carefully, time and money will be saved in future and ensure that the study is sustainable and can be performed within the given time- frame.

Methods

The explanation of the intended research methods should be sufficiently thorough to ensure that the reader will have no doubt about how the research objectives will be addressed. The rationale for the method chosen must also be made apparent. First, the study design should be presented; descriptive, cross-sectional, longitudinal, or randomized controlled trial.

Second, a clear description of the sampling plan and the number of participants to be included should be provided; the number of participants should be justified statistically, as should the method of randomization. In this section describe the method of recruitment of participants. If the method encompasses an experimental design, a statistical power analysis must be carried out to demonstrate the ability of the research design to detect relationships between variables. A power analysis determines the minimum number of samples that need be included in order to achieve a true difference between the groups.

Third, a thorough methods section should include a description of the instruments to be used in the study; for example, questionnaires, specific procedures such as programmes for patient education, or equipment. Copies of questionnaires should accompany the proposal. Data collection and analytical strategies, such as data management and method of interpretation to be used after collection of data should be described. Potential methodological problems and intended strategies for dealing with such problems need to be discussed in this section.

Finally, in order to ensure that the study is proceeding according to plan, the monitoring process to be performed should be described [5].

Ethical Awareness

Any ethical implications of the study should be described and an explanation as to how they will be handled should be given because the integrity of the study participant (patient or healthy volunteer) must be protected at all times. This is described in the Declaration of Helsinki and the Ethical Guidelines for Nursing Research [6,7]. The risk to the individual participating must not exceed the expected beneficial results, both in the case of the individual participant and the larger group of participants [8]. Participation must be voluntary and consented to only after accurate, detailed written information is provided about the study's positive and negative implications for the participant. Describe here how the participants are to be given information about the study and how informed consent will be obtained. If there is an insurance policy covering any injury caused by the study procedure, it should be mentioned here. A copy of the application to the ethics committee may be attached to the research proposal and a copy of the Patient Information Form and Informed Consent Form should also be attached.

Time Frame

There never seems to be sufficient time for the perfect study to be conducted, but in order to facilitate the study to proceed, it is helpful to state a realistic deadline for the completion of the

study, some deadlines for the milestones of the study, such as ethics committee submission deadline, and to make allowance for delays if the committee requests further information. Also state a deadline when data collection should be completed, when the report should be finalized (an example of a timeline is given in Table 1). This enables the funding agency to judge the value of the money requested for this particular study. They might have an interest in getting certain information from the study before a certain date.

Study Personnel

A study requires certain formal scientific skills in order for the research to be carried out appropriately. The formal skills and research experience in the area of the participating members of the team should be described here. The mix of researchers in the team and their experience with regards to the method(s) used should be described, as well as the contribution the researchers claim they will be able to make to certain parts of the study. Communication within the study group may be structured; mention at this point, if appropriate, the forms of communication – web site, regular telephone conferences, etc. The researcher's suitability and other team members' competencies for performing the study are typically given major consideration in evaluating the proposal.

Facilities

The proposal should document the extent to which specialist facilities and/or equipment required by the project, such as access to physiological instrumentation, libraries, computers, data processing equipment, special documents or records, or laboratories, will be available; for example, the project may require a web site. This should be described to reassure sponsors or advisers that the project will be able to proceed as planned. The willingness of the institution to which the researcher is affiliated to allocate space, equipment, services, data and secretarial support should be indicated.

Budget

The funding requested must be justifiable in relation to the information to be derived from the study. The budget is judged in relation to the kind of application made, whether the project is long-term or short-term, or an application for planning time. Include consumables, software, cost of shipping and postage, staff, equipment, localities, reimbursement to participants, medical investigations, laboratory analysis, time for analysing and presentation of the results, including travel expenses and conference fees, and application fees. If the study design implicates fasting visits (often com- mon in diabetes research), a nice breakfast should be offered to the participants and an appropriate sum should be included in the budget. Finally, the institution's increased/ overhead cost will be added to the budget sum. Currently (2005), Karolinska Institutet, Stockholm, charges 54.5% as overhead cost.

A well-conceived protocol greatly facilitates the preparation of the budget, which should be presented on a separate sheet in a table format. If there are any inordinate difficulties in detailing financial needs, there may be rea- son to suspect that the protocol is insufficiently developed. Funding for research projects is becoming more and more difficult to obtain and in Sweden, large studies of a multi-professional design, with research questions raised by different professionals, claim priority.

Conclusion

The written research proposal represents the means for opening communication between researchers and parties interested in supporting the conduct of research. Those parties may be funding agencies, faculty advisors, or institutional officers. An accepted proposal is a two-way contract; those accepting the proposal say that 'We are willing to offer financial support as long as the investigation proceeds as proposed', and those writing the proposal are saying 'If you will offer support, then I will conduct the project as proposed'.

Finally, the proposal document should be as attractive as possible. A neat and pleasing appearance invites the reviewer to read the proposal and suggests that care has been taken in its preparation. The text should be as clear as possible as committees are made up of members from different professional backgrounds.

If the funding applied for is received, remember to express gratitude after the study has been performed and the report has been written, by providing the funding agency with a copy of the report. At the end of any published article, financial support should be acknowledged in a format agreed between the researcher and the agency. This might increase the opportunity for a successful application for the next study.

Conflict of Interest

None.

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