

The Basics of Research in Ophthalmology

The knowledge explosion that we have witnessed in the 20th and 21st century and its mind boggling impact on human civilization through rapid technological developments, owe it all to advances in reasoning leading to innovative research. Advances in medical knowledge including ophthalmic knowledge and practices are not an exception to this rule.

In the early 20th century there were no strict ethical rules governing medical research. As a result of absence of such rules, during the Second World War, some basic fundamental human rights were reportedly violated. The verdict delivered by the judges against the "The doctor Trial" in 1947 lead to the development of the famous ten point Nuremberg Code.¹ This Code was later modified by the World Medical Association and eventually adopted as the famous Declaration of Helsinki (DOH) in 1964.²

This set of global principles have been subjected to a number of revisions to ensure that it meets the current and future requirements of biomedical research.³ New and more detailed guidelines are now prepared by other interest groups like the Nuffield council on Bioethics, UK, the EU guidelines and the international Ethical Guidelines for biomedical research involving human subjects prepared by the Council for International Organizations of Medical Sciences in collaboration with the World Health organization.⁴

Apart from creating new knowledge, application of Innovative research adds value to human health and also provides a mean for rapid social and economic growth and development of the country.

While the basic scientists are focused on advances in the basic anatomical and physiological aspects of human body including the visual apparatus, clinicians are constantly engaged in enhancing our knowledge and understanding in disease causation, its pathological effects, its impact in terms of morbidity and mortality and its prevention and treatment. While the epidemiologists will tell us about the pattern of diseases, other medical scientists will be engaged in health system research who will answer our questions about the efficient and effective organization, funding and the mechanics of health delivery systems. Still

others would be engaged in research on the social and cultural aspects (medical sociology and anthropology), law (legal medicine), medical ethics and medical practices (clinical trials). Currently there has been a lot of emphasis on impact measurement in terms of Quality of life (QOL) and patient satisfaction through qualitative research. More recently, there is a lot of research going on in the field of medical education, training, evaluation and lifelong commitment to learning.

Modern medical research is much cost and labor intensive. It needs tremendous personal commitment and generous funding. In order to attract necessary funding, the expected research outcomes must have the potential of a strong positive impact on human health and happiness. The paper based on the results of the project should be of such high quality that it should not only find a suitable place in an internationally respected medical science journal, but should make significant contributions to new knowledge with a strong possibility of opening up new avenues for scientific and technological development.

Before selecting the research question, it should be carefully examined in the light of its complexity, relevance, applicability, impact, the possible cost, the ethical dilemmas involved in the methodology and the simplicity of the model in terms of retesting the validity and reliability of the results. Review of necessary literature is must, but plagiarism must be avoided at all costs.

Once you have prepared the abstract of your research project, it must be submitted to your concerned ethical board for approval. Any conflict of interest must be declared at the outset. Any financial support in the form grants etc. must be acknowledged.

For a young scientists with a career in medicine, there are only two possible options, publish or perish.

Once your abstract is approved, you should chose a journal or few journals where you would like your article to be published. Read the instructions to the author carefully and try to follow the instructions as closely as possible.

When it comes to writing your article, follow the general instructions for writing a scientific article.

The write up should follow the basic structure of a scientific article.⁵⁻⁷

Title: It should be short, specific and comprehensive. Avoid abbreviations.

Abstract: should cover, Study Goal/Objective, Study design, Patient and methods/Material and methods, Results, Conclusions and key words.

Introduction: should consist of brief review of the current knowledge, questions that need to be answered and state what you intend to do.

Method: Should include the age and gender of the specimen, selection criteria, informed consent, experimental design and method of statistical analysis based on sound scientific principles of research. Give enough details to enable the peers to check the validity of your results.

Results: communicate your results clearly. Use table and graphs. Avoid fabrication and falsification.

Discussion: summarize your results. Explain whether your research findings have answered the research questions raised. Compare your results to the findings of other investigators. Give references.

In the final concluding paragraph, firmly mention the point you are trying to make. If there are still some questions unanswered, express your interest in future research on the subject.

Acknowledgements: Thank those who have helped but whose names could not be included as authors.

References: Put them in the style preferred by the journal selected.

Submission of manuscript: Follow the instructions to the author. Before you submit the manuscript, you

must go through the uniform requirements for manuscripts submitted to biomedical journals 1997.⁸

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