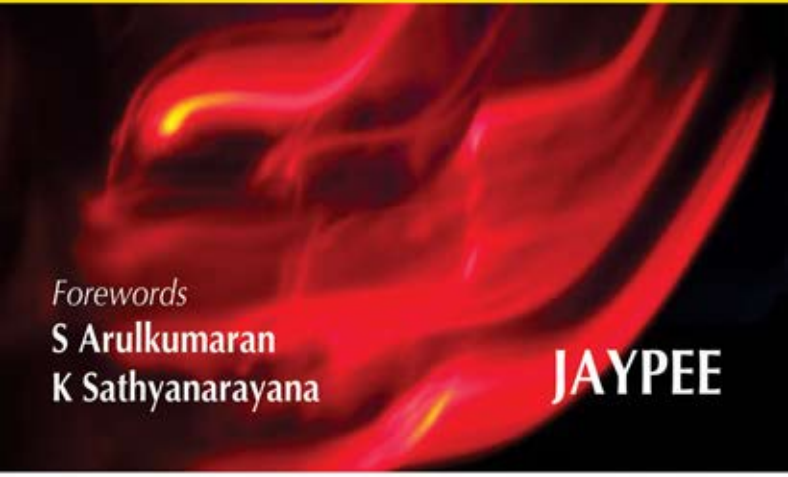




ABC of Research Methodology and Applied Biostatistics

**A Primer for Clinicians
and Researchers**

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Forewords

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JAYPEE

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CHAPTER

ONE

Introduction

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WHAT IS RESEARCH?

Indulging in research improves every aspect in all fields of human activity. It is not easy to define research. Various definitions of research range from careful, diligent and studious scientific enquiry or examination for discovering and interpreting new knowledge, to collecting new knowledge on a chosen specific subject, to discovering new facts and verifying old ones. Research is at the core of improving human comfort and quality of life. Research in different branches of biomedical sciences is at the centre of preventing, diagnosing and treating diseases.

WHY DO WE DO RESEARCH?

The main purpose of research in medicine is to prevent sickness and improve patient care by all possible ways. Diseases can be prevented by finding out their causes or etiologies, developing immunity by vaccination, adopting healthy and nutritious diet, giving dietary supplements, changing life styles (e.g. avoiding tobacco, alcohol, unprotected sex, high cholesterol fast foods etc), improving hygiene and so on. Knowledge about all these is acquired from research studies. Diseases can be better treated by diagnosing them early by researching new diagnostic tests and imaging modalities. Research helps in improving management of the sick in various ways like developing new drugs having greater efficacy, lesser side effects, greater compliance by virtue of better taste (sugar coating to mask bitterness), convenient mode of administration (oral, rectal, vaginal and dermal in preference to injections), lesser number of dosages needed (monthly preferred to weekly preferred to daily preferred to many times a day) and developing better interventions

(transverse abdominal incision preferred to vertical one, vaginal surgery preferred to abdominal one, endoscopic surgery preferred to laparotomy) and the list goes on and on. Continuous research leads to better and better patient care which is the main purpose of conducting research.

There are other reasons why we indulge in research. Doing research gives mental satisfaction of contributing to science and society. It helps one to acquire honours and respect from peers in scientific community and in society. Good research adds meaningfully to one's curriculum vitae and leads to rise in the ladder of promotion. In fact, today, every one in academic position has to do good research for publication in good journals even for mere survival in his current position. The present culture of publish or perish is widely accepted in all good academic institutions.

Medical research also helps administrators to work out priorities for utilizing their limited funds for giving maximum benefits to maximum people. Research also helps policy makers to frame policies to improve health care. Lastly, better medical care depends on development of new drugs or new molecules of drugs by research done by pharma companies. Similarly, manufacturers of instruments and equipments contribute to better patient care by their continuous research.

We constantly strive to improve whatever we are doing. This is done by inventing a new way of doing a thing eg invention of washing machine is an improvement on manual washing. As clinicians we are perpetually trying to improve every aspect of patient care. We want simpler and more reliable diagnostic tests and investigations with greater accuracy. We invent new tests and do research to find out whether these are superior to the ones we are presently using.

Pharmaceutical companies do basic research to develop new drugs or new molecules of existing drugs which, when compared to currently used ones, are more effective in fighting diseases and are more user friendly by virtue of taste, lesser frequency of dosages, and noninvasive mode of administration. So do the manufacturers of gadgets, instruments, equipments, and machines. Surgeons constantly work on developing new surgical techniques. Research studies are needed to evaluate all such new inventions to find out whether they are superior to those that are presently being used. All the new tests, drugs, devices, equipments, interventions and surgical techniques are the outcome of research in biomedical sciences. The prime and the most important purpose of research is to improve patient care in all possible ways.

CHOOSING A TOPIC FOR RESEARCH

The first step in starting a research study is to choose a topic for research. The topic must be related to the area of your interest. You should also consult your colleagues and seniors for their suggestions regarding a good topic. Attending conferences, seminars, and workshops and reading journals also gives you good ideas regarding topics for new research. In short keep your eyes and ears wide open while looking for a topic. If the topic is vast like mental depression identify important areas in that topic and choose to work on some of these areas. It is very rewarding to concentrate on controversies and/or gaps in the knowledge in your chosen topic. It is not worth while to spend energy, time and money to reconfirm universally accepted facts. But a study aimed at challenging any aspect of these accepted facts should get

your top priority. Work on topics that really interest you, studies that are meant to find answers to questions you are dying to answer, and studies that aim to challenge current beliefs. One must continuously question everything that we do and ask oneself whether that is the best way of doing things and why one should not try to find a better way of doing things. A good researcher is like a child who is constantly curious, perpetually asking questions and always demanding answers. Given a choice assign priority to studies which have greater relevance to diseased people. However, for any reason you are required to work on a topic not of your choice say in the interest of your institution or department do so with all sincerity and complete dedication.

ABC of Research Methodology and Applied Biostatistics

A Primer for Clinicians and Researchers

MN Parikh is a renowned teacher of obstetrics and gynecology for over 50 years. Presently, he is Professor Emeritus at Seth GS Medical College and Nowrosjee Wadia Maternity Hospital, Mumbai (India). He was President of Federation of Obstetrics and Gynecology of India besides those of IAFS, IAJAGO, and NARCHI. He is founder president of Indian Society of Assisted Reproduction as well as President (elect) of Indian Society for Prenatal Diagnosis and Therapy. He has been actively involved in writing work and is associated with over 70 publications of Indian and foreign journals. He is well-known for authorship of his book *Textbook of Obstetrics* (4th edition). He is Editor Emeritus of the *Journal of Obstetrics and Gynecology of India*. He is devoted to improving the quality of research being done in India.



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