Choosing a Suitable Research Area and Supervisor

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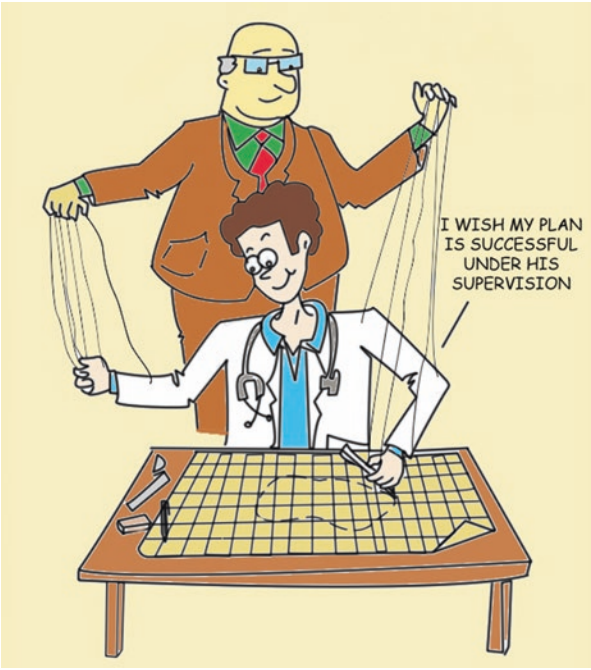
"It is our choices, Harry, that show what we truly are, far more than our abilities."—J.K. Rowling



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S. C. Parija, V. Kate (eds.), *Thesis Writing for Master's and Ph.D. Program*,
https://doi.org/10.1007/978-981-13-0890-1_3

Key Points

- Most research topics are selected with ease using a lot of common sense.
- Meticulously selected research topics are easy to work on and more likely to finish in the given time frame.
- It is vital to know the time frame and resources available right from the start to accomplish the research project.
- A good mentor can not only facilitate the research project but also, eventually, help in getting published.
- The research topics are everywhere. From within one's own thoughts to the existing status of healthcare there are infinite possibilities of useful research topics that could advance the field of medical science.
- Finding a suitable mentor, with expertise and interest in the selected research topic is as important as selecting the research topic itself.
- Some research projects need more than one mentor.
- Mentorship is a learned skill.
- Both the mentor as well as the mentee works together with compassion, dedication and develop/evolve the new idea. Both are 'involved' in the new concept and make the concept 'evolve'.
- For publishing the research, the study design needs to be optimised. Narrowing the topic improves the focus and makes the conclusion more accurate.
- To succeed in the publication of a research project both mentor and mentee have to play their roles while molding their characters to fit in with their responsibilities.

> In the search for certainty, it is natural, to begin with our present experiences, and in some sense, no doubt, knowledge is to be derived from them [1]—Bertrand Russel (Problems of Philosophy)

Introduction

Common sense is the main ingredient of good science. With the help of it, a carefully chosen and well-focused research topic can simplify the process and make it interesting. The successful selection of right topic and right mentor depends on several factors, some of them are under your control, but many are not. However, what one can do as a researcher is to be open to learning, corrections and even failures.

A meticulously selected topic is carried through to its publication with ease and the entire experience becomes an enjoyable journey. On publication, the article attracts many readers and keeps on appearing repeatedly in the references of many future studies. If the study turns out to be a ground breaking work, it does not merely remain the matter of name and fame, but often creates career opportunities for the authors.

How to Choose a Suitable Research Topic

The process of choosing a suitable research topic can be summarised in a single word—"re-search". Even though it is possible to summarise it in a word, finding a good topic is probably one of the most difficult things about research. And it is an evolving process. However, prior to embarking upon this, the researchers must ask two simple questions to themselves.

1. What is the given time frame?
2. What resources are at my disposal?

Basic Principles for Finding Suitable Topic

1. Seek help, find a mentor: This has been elaborated in detail under the heading, 'Choosing a Mentor'.
2. At the onset of selecting a suitable topic for research, try to look for a question, a project or a field of your interest. It is always easy to write about the topic of your interest, e.g. Surgery, Medicine, Maternal Health, Nutrition, Mental Health, Preventive Medicine, Infectious Disease, Nursing, Physiotherapy, etc.

Where to Find the Topics of Interest?

It is likely that there is a particular health issue that inspired you to enter the profession which you have chosen for your career. At some point in your career, it might have struck you that certain issues surrounding current standard of care or the outcomes are not up to the mark and might benefit from a renewed strategy. This is where a research topic might be unfolding itself.

There could be different approaches, management strategies or surgical techniques that need verification as to the superiority of one over the other in terms of prognosis, life expectancy and event-free survival benefits. This is a breeding ground for research topics. Review of topics covered in textbooks could generate a lot of research potential when they are read between the lines. Good texts in the books often mention about the pitfalls in the diagnosis and management of many ailments and conditions. Selecting a topic aimed at answering those questions can advance the health science as a whole. These are the fields where most of the medical research is blooming.

The table of contents of National Health Statistics is also a very important source for choosing a topic of interest that could make an impact on National Health Policies. Health Care Management issues in an institution, the cost control measures required by the health organizations are all extremely potent sources of research topics.

Many times, the experience comes handy for those who have already worked in specialized fields. Their insight into the specialty provokes the thoughts for methods to improvise the existing systems, techniques or even medicines. For those who had

no such opportunity, maybe there is a particular disease or a clinical condition that stirs a curiosity in you, through your own experience or that of your family or friends.

Sometimes, topics of combined or social interests, such as health issues involving a particular racial or ethnic group that one would like to learn more about could bring the need for research into light. For example, are there any disparities between different ethnic groups in terms of access to the health services compared to the mainstream population.

Controversial issues: Sometimes some controversial issues are interesting to explore. For instance, Comparison of different techniques of inguinal hernia repair, comparison of different strategies for treating multi-vessel coronary artery disease in octogenarians, etc. There might be a recent article or news in multimedia that could be of interest to the community, such as primary preventive measures, best secondary or tertiary preventive measures.

3. The Ultimate Source: By and large the best source for specific research topics is the recent research studies. A good research article, at the end, identifies the implications or recommendations for future research. The epigraph at the beginning of this chapter by the great philosopher, Bertrand Russel, is so apt in this context that wishfully, it could be set in neon lights for this 'search'.

Virtues of Writing Down as the Search Begins

In order to maximise the output from your effort, get into a habit of writing as soon as the idea is conceived. By developing this habit, you might be able to write multiple papers based on different dimensions of the topic. However, to have that ability, you have to identify your key idea first.

What's an idea? An Idea is defined in many ways. But one definition stands out which says, "The idea is a reusable insight, useful to the reader." Remember, at the outset that your initial idea might vary during the first phase of choosing the suitable topic itself. It might even span out into three ideas. Keep your mind open to the possibility of writing three different papers.

Most importantly, selection of the suitable research topic is strongly influenced by time frame and availability of resources, as has been emphasized at the beginning of this section.

Narrowing the Topic/Choosing Specific Research Focus

To succeed in publishing the research, optimising the study design is the single most important factor, whether the project is a basic science experiment, a clinical trial, or a population-based study.

The beginners in this field often pick a broad, general topic, thinking that big topics are easier to research. But some topics are just too big to research, for example, eating disorders, physical fitness etc. The problems with big topics are multiple. They are overwhelmingly difficult to acquire the data and design a proper protocol. Therefore, avoid time-consuming studies with multiple investigators involvement,

at least in the beginning, where your role might become minimal. On the other hand, the study should not be too simplistic, like, writing a case report, as it is not a research. Also, developing a new tool or technique could be more satisfying. However, this could be a monumental task and might require more inspiration than most research and eventually, it might end up being less productive.

How to Narrow the Topic

One simple way of narrowing a research topic is to try to look for a project that is driven by a hypothesis or a well-defined observational study.

In order to add focus to the design, look at the study and ask yourself five simple single worded questions about it, *Who*? *What*? *Where*? *When*? and *How*?

Firstly, ask yourself, *who* might benefit from the study? Try to focus on particular age group or a group with certain risk factors who are at risk or likely to improve on the proposed intervention or management plan.

Secondly, ask, *what* kind of effects are anticipated? e.g. reduce blood pressure; affect a measurable level of serum or urine bio-marker; prolong the survival; avoid the recurrence of the problem; reduce adverse events such as end-organ dysfunction; diminish stay in the Intensive Care Unit; improve the quality of life or significantly affect the hardest end-point which is to cheat death.

Thirdly, ask yourself *where?* Can your hypothesis be tested on a single event, specific group, limited period, one cause or effect, one argument or a viewpoint?

The fourth step would be to ask, *when*? Patients studied in a specific time interval significantly reduces the size of the study. However, it must be remembered at this stage that for a meaningful conclusion the sample size has to be adequate.

And finally, *how*? This is the time to work on the protocol of the study.

There are different study designs to consider. The Classic example would be the Null hypothesis.

Medical research has many dimensions that have evolved over the past two decades after clinical trials have exploded into this field. There are legal, regulatory, ethical, statistical, procedural and clinical dimensions which influence the field of medical research and have changed the structure of the research methodology, which were not prevalent to anyone who entered medicine decades earlier. It is important for the researcher to implicate these dimensions into the study design and give an excellent amount of depth to the chosen research topic (Fig. 1 and Table 1).

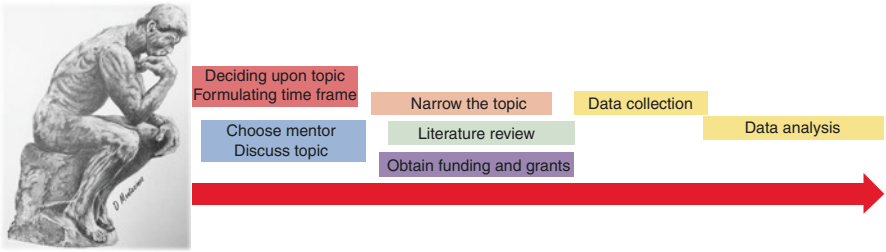

Fig. 1 Flow chart depicting the process of commencing research project with the help of a mentor(s)

Table 1 Key factors: choosing a research topic

Look for the right people who could help you
Find area/field or project of your own interest
Find a well-defined project that is within your capacity
Project should be worth doing. The question should be worth answering
Balance your thoughts, your interests and your independence with those of others

Choosing a Research Mentor

Several studies underline the importance of a Mentor in clinical research [2–5]. To understand why we need a mentor in research, a glance at the illustration in the figure, that has been adopted from Cohen et al., might be of help. Each has to balance a number of imperatives in personal and professional lives. Your personal needs must be balanced with relationships with others [6]. At the same time, professional development and responsibilities must be balanced with personal, in the interest of all parties involved. The major function of mentoring is to aid in developing four individual components and help you in keeping them in balance.

In this context, it is interesting to read how Keyser and Zukerman have separately defined the phenomenon or process of Mentoring. According to Keyser, " Mentoring is a dynamic reciprocal relationship environment between an advanced career incumbent (mentor) and a beginner (protégée), aimed at promoting the development of both." [5] And as per Zukerman, "Mentoring is a complex multidimensional process through which emerging scientists acquire the norms and standards, values and attitudes, and knowledge, skills and behaviours to develop into successful independent researcher." [7]

It is important to recognize the fact that the relationship between the mentor and the mentee needs to be based on compassion, always positively charged and constructive. Occasionally, that might not be the case. The needs and interests of each party often change. Accordingly, the ability to work in effective partnership may change. More often than not, a mentor-mentee relationship fails, when the mentor is not able to separate his or her needs from those of his mentee [8]

Mentorship: A Learned Skill

There are studies to demonstrate that mentorship is an acquired skill. It works better when supported by the institution in addition to the interest taken by the mentor in his mentee and the project [9] (Table 2).

Responsibilities of a Successful Mentee

It is understood that both the mentor and his mentee must be committed and interested.

Table 2 Essential elements of a successful mentor

Interested in serving as a mentor and is compassionate.
Flexible to commit time and effort.
Able to recognize and even keep aside, at times, the personal interests of those of the mentee.
Has the expertise in the area in which he/she is acting as a mentor

Table 3 Characteristic features of a successful mentee

Capable of clearly defining the support and help he/she needs
Recognises the fact that only one person may not be able to help in meeting all the mentoring needs
Recognises the fact that only one person may not be able to help in meeting all the mentoring needs
Recognises the fact that only one person may not be able to help in meeting all the mentoring needs
Recognises the fact that the needs for mentoring do change all the time
Recognises the fact that only one person may not be able to help in meeting all the mentoring needs
Able to accept the constructive criticism and work through it
Interested in working with mentor for help
Commitment to make an effort to enable the relationship to develop and function

Scheduled regular meetings are essential for planning and implementation.

Formulate questions well in advance of such meetings related to technology, research methodology, data analysis, funding, and other resources that your mentor can help you answer.

The concerns regarding time management, ethical aspects and even dealing with difficult colleagues and supervisors, should be sorted out with discussion.

A mentor should be able to help you address questions regarding research related networking, even promotions and jobs.

You might need more than one mentor to accomplish all objectives (Table 3).

Conclusion

With regard to both, choosing a project and finding mentors, enlightened self-interest is the key. This exercise is certainly going to provide the researcher with immense personal satisfaction and develop cognitive skills that are universally helpful. It is a labour of love, after all. Just like many things in life, even if you don't get it right the first time, never give up, because you almost always get there!

Case Scenarios

1. You are a third-year resident working in the department of cardiology where you are routinely exposed to different protocols of managing anti-platelet therapy

after coronary stenting and there are several conflicting protocols adopted by different Specialist Cardiologists in the department.
   (a) What would you think about the superiority of one protocol over the other in the population that you are treating at your institution.
   (b) What is the evidence in the literature for preventing stent thrombosis.
2. You are a junior consultant in general medicine working in a small district hospital where certain ethnic group of patients has significantly worse outcome despite identical prescription for a proven clinical condition.
   (a) How would you narrow the research topic?
   (b) What factors would you think are responsible for different outcomes in two ethnic groups?

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