

## Chapter-4

# How to develop research question And select a research topic

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The research question and research topic are interrelated but not synonymous. A **research question** is a previously answered question about a certain different aspect of the topic which may be a disease condition or a physiological or pathological phenomenon or an anatomical, biochemical physiological, molecular or genetic basis of disease. The research question should always be meaningful and ethical. It is important that one knows as to what kind of evidence doctors need in today's era of evidence based medicine. Questions about treatment are often complex and qualitative which remain un-answered. One should always ask some useful questions that have an applied relevance. For example “ is the use of hot tea associated with esophageal cancer?” , is a useful research question but what are the different types of shapes of notch of scapula in say Pakistani population? , is a rather suboptimal research question unless the context is explained e.g. what are the different shapes of the notch of scapula that may affect a action of a relevant muscle?

One can always show the bright as well as dark side of the questions. Sometimes the inclusion criteria are too selective. It is essential that one should carry out a thorough literature search and discuss previous evidence with colleagues before framing the question. Find out the type of information needed and the source of this information. A question which does not excite curiosity in anyone is considered not a good question. Make sure that the research benefits the patients, improves patient care, result in overall improvement in healthcare delivery system or

improvement in teaching and training if you intend to do some research in the field of medical education. It is essential that the design of the study matches with the question for validity of the study. See what is already known and then highlight what your study has added to the knowledge. Remember that research is basically an answer to “why/how has this happened or appearing like this or will change if I perform this test/procedure or prescribe this medication/in this condition, in this group of patient?”

Again, a study question is different from the **rationale** of the study which is basically the justification of the study as to why this research is being/ was done. It is also not to be confused with **research hypothesis** which basically is a probable negative answer to the study question (the **null hypothesis**) and a possible alternate answer (the **alternate hypothesis**). These distinctions are particularly important when a research is to be written according to a certain prescribed format for example a synopsis, a grant, and a thesis or dissertation.

### **Ethical Issues**

There are certain ethical issues in nearly all types of research not like “what would happen if a group of patient is given an analgesic and the other group in similar pain is not”? The information one should give to the patients before taking their informed consent to participate in the study must be relevant and explain both the positive and negative with their implications. The population can be exposed to some unforeseen adverse effects. Sometimes the researchers offer incentives to the people to participate in the study. These needs to be looked into in detail as offering some drugs for treatment or transport coming to the center or follow up may be ethical but any incentives beyond that will be highly unethical. Conducting unethical research and getting it published should be discouraged. All journals these days demand an ethical approval for the submitted research so better apply early for such approval from your institute instead of asking exemptions later.

## Selection of a topic for study

Young budding researchers and postgraduate often find it difficult to select an appropriate topic for research. It is the duty of their supervisors to help and guide them in this regard but sometimes it does not happen. To select a topic one has to take care of the following:

1. The topic selected must be interesting which will ensure interesting results. For this the researcher should conduct a thorough search of contemporary research regarding the condition in mind. This would help identify the trend of research and select as to how a new aspect of the condition may be identified for developing the research question. Most importantly it should be a topic for which one can find appropriate number of patients in a time-bound study as is often done in research-based degree programs.
2. **Sample Size:** All good journals and research degree based programs in particular enquire for the justification of the number of cases in your study (the sample size). A statistician should be consulted prior to conducting the study to find out the appropriate sample size. For a very rare disease even a study of fifteen to twenty patients may be considered good enough but if the disease is quite common like hypertension or diabetes, one might require a hundreds of patients to draw any valuable conclusions from the study. Before consulting the statistician, the researcher must get latest references for the prevalence/ incidence of the relevant condition as this is required in the formula for sample size calculation. If epidemiological data is not available despite thorough literature search then some published articles on that condition, should be consulted to get a justification for your sample size.
3. **Time Period:** It is also important. How much time you have to complete the study. Will you be able to get enough number of patients during that period? In case you have selected a topic wherein the disease is very rare, you may not find adequate number of patients, hence you won't be able to complete the study.

4. **Funding:** While planning any study, ensure you have adequate funding. For example, if every patient included in the study needs to have CT or MRI or some other expensive laboratory investigations, do you have the funding for that or will the patients be able to afford that? All the patients may not be affording and if you have not arranged funding before the start of the study, you won't be able to complete the project in time.
5. Those doing MS, MD, M. Phil or PhD have about one to three years to complete their research project and then prepare the write-up for publication. If you are not mindful of the time constraints in the beginning, you may face problems later.
6. Topic should always be selected with the approval of your supervisor in case of supervised research. Try to select topics in which your supervisor is interested which would ensure his/ her support and contribution. The supervisor's previous track record and publications help in the decision regarding the selection of both the supervisor and the topic.

#### FURTHER READINGS

1. Jawaid SA. Second International Conference on Publication Ethics organized by Shiraz University of Medical Sciences (Shiraz Iran December 4-5, 2014). Pak J Med Sci 2015;31(2):251-262. doi: <http://dx.doi.org/10.12669/pjms.312.7313>
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